

GUY'S HOSPITAL REPORTS.

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J. H. BRYANT, M.D.,
AND
F. J. STEWARD, M.S.

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CONTENTS.

	PAGE.
I. On Disease of the Heart due to Over-Indulgence in Alcoholic Drinks. By W. HALE WHITE, M.D.	1
II. A Contribution to the History of the Intravenous Injection of Drugs; together with an Account of some Experiments on Animals with Antiseptics; and a Bibliography. (Thesis for the M.D. Oxon.) By J. M. FORTESCUE-BRICKDALE, M.A., M.D. ...	15
III. Eosinophilia in Skin Diseases. By HERBERT FRENCH, M.B., B.Ch. Oxon., M.R.C.P. Lond.	81
IV. Some Cases Illustrating the Influence of Heredity in Angeio-Neurotic Œdema. By C. A. ENSOR ...	111
V. Malignant Disease of the Stomach; with Appendix of Cases, 1826—1900. By Sir COOPER PERRY, M.D., and LAURISTON E. SHAW, M.D.	121
List of Gentlemen Educated at Guy's Hospital who have passed the Examinations of the several Universities, Colleges, etc., in the year 1902 ...	363
Medallists and Prizemen for 1903.	370
Clinical Appointments held during the year 1902 ...	372
Dental Appointments held during the year 1902 ...	378
Medical and Surgical Staff, 1903	381
Lecturers and Demonstrators	382
The Staff of the Dental School, 1903	384

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ON DISEASE OF THE HEART DUE TO OVER-INDULGENCE IN ALCOHOLIC DRINKS.

By W. HALE WHITE, M.D.

THERE is a form of disease of the heart which has attracted very little attention in Great Britain but which is often described in German medical writings, namely, that associated with an over-indulgence in alcoholic drinks.

In 1877, Münzinger called attention to the frequency of dilatation and hypertrophy of the heart among the inhabitants of Tübingen and the phrase "Tübingen heart" came into use. Buhl and Bollinger soon showed that dilatation and hypertrophy of the heart, for which no ordinary cause could be found, also occurred in Munich, and the phrase "Munich heart" was employed. All those who suffered from either the Tübingen heart or the Munich heart drank excessively of beer. Unfortunately, it was soon found that this form of heart disease was not limited to Tübingen and Munich, and it was recognised in many other places. Osler, in referring to the German writings on the subject, says that Strümpell, at his Erlangen clinic, told him that the condition was very common in that town among those who worked in breweries. Sometimes as much as twenty litres or about thirty-five pints of beer a day are drunk by a

single individual. Albrecht¹ of Berlin and Krehl² of Greifswald and many other authors have described cases. Bauer and Bollinger³ in 1893 published an important monograph on the subject. Bollinger, of Munich, found 244 cases among 5,720 post-mortem examinations, or about 4 or 5 per cent. We may, I think, take it as proved that there is a serious form of cardiac dilatation and hypertrophy due to the excessive drinking of beer. Krehl, in Nothnagel's *Specielle Pathologie und Therapie*, devotes a separate chapter to the heart disease which follows excessive indulgence in alcoholic drinks, and while he fully admits the existence of what he calls the "Beer heart," he is somewhat doubtful whether the same condition follows excessive drinking of wine, but with regard to its following spirit drinking he says that at any rate it must be very rare, and he himself knows of no case.

To my mind, Krehl shows a commendable caution in heading his chapter "Heart Disease due to Over-Indulgence in Alcoholic Drinks," for the very fact that the condition is so well known where beer is drunk, and rare where other forms of alcohol are taken to excess, raises a very strong doubt as to whether it is the alcohol that is the cause of the trouble. In other diseases, for example, cirrhosis of the liver and peripheral neuritis, the consumption of alcohol is not co-extensive with the prevalence of the disease (for example, cirrhosis of the liver is common in London but rare in Scotland), and we do not know for certain which is the offending constituent of the alcoholic drink, so it is much more accurate to describe the affection as due to alcoholic drinks rather than to alcohol. Probably the part played by the alcohol in many diseases has been exaggerated, for it is difficult to reproduce most of them by the administration of absolute alcohol to animals. In passing, too, I may, I think, urge

¹ Albrecht. *Der Herzmuskel und seine Bedeutung für Physiologie, Pathologie und Klinik des Herzens*. Berlin, 1903.

² Krehl. *Die Erkrankungen des Herzmuskels und die Nervösen Herzkrankheiten*. Nothnagel's *Specielle Pathologie und Therapie*. Bd. xv. Th. I. Abtheilung v.

³ Bauer und Bollinger. *Ueber idiopathische Herzvergrößerung*. München, 1893.

that in considerations of this sort we are inclined to pay too much attention to the alcoholic drink and too little to the body on which it acts. There surely must be slight chemical differences between different parts of the body. Unless this is so it is almost impossible to imagine why alcohol affects branches of the anterior tibial nerve earlier than branches of other nerves; or again, why lead always picks out the musculo-spiral by preference, and if there are these slight differences between different parts of the same body probably there are slight differences between different individuals, and an alcoholic drink which will cause disease in one man will not affect another, a conclusion which is no more than that arrived at by the proverb, "What is one man's food is another man's poison." But writers often forget this aspect of the subject. Inasmuch as it is impossible for alcohol to produce neuritis of the anterior tibial nerve, unless there is something in the nerve for the alcohol to act upon, the cause of the neuritis lies as much in the nerve as in the alcoholic drink, so that, regard the subject which way we will, we must look not only to the agent applied to the body from the outside, but to the body itself if we are to try and get a clear comprehension of the ætiology of a disease.

To return to the heart disease due to alcoholic drinks. Because it is so much more common among those who drink German beer than among those who drink other alcoholic drinks it has, as just remarked, been suggested that it is not the alcohol which is the exciting cause. Some are inclined to think it may be the carbohydrates in German beer, but if so it must be some special form of carbohydrate, for carbohydrates in general do not lead to cardiac hypertrophy and dilatation; if they did this heart trouble would be often seen among Irish peasants, who live upon potatoes. It has been also suggested that the large quantity of fluid drunk by these beer drinkers is the cause of the hypertrophy and dilatation, but the body so quickly gets rid of an excess of fluid in the vessels that we have no certain proof that the total amount in the vessels at any time is much above normal, and then again, the work of the heart is the resultant of the quantity of blood and the rate of the flow, and if the quantity is increased it may be

that the rate of flow is diminished, for a rapid pulse does not necessarily mean a rapid flow. Another reason for doubting whether a large amount of fluid in the vessels—a hydræmic plethora—will entirely account for this enlargement of the heart is the condition of that organ in diabetes. Many diabetics drink largely and have polyuria, and yet the heart is usually small in this disease, sometimes very small. It is true that diabetes is a wasting disease, but at any rate we can say that the large amount of fluid passing through the vessels does not lead to sufficient cardiac hypertrophy to prevent the wasting attributable to the diabetes. Bearing, too, on this question is the fact that those who drink excessively of water—for example, the stokers of vessels in the tropics—do not suffer, as far as we know, from cardiac dilatation and hypertrophy. It has been said that the salts in the beer are the cause of the trouble, but of this there is no proof, nor is it likely that Bauer's suggestion that the hypertrophy is caused by increased peripheral resistance due to alcohol is correct, for the pulse is always low tension.

Although most German writers omit to do so, allusion must be made to the possibility that this form of heart disease is due to alcoholic neuritis of the vagus. This undoubtedly occurs, indeed it is one of the causes of death in alcoholic neuritis. The pulse becomes irregular, rapid and weak, the patient dying from cardiac failure; but probably sufferers from an alcoholic heart do not owe their condition to neuritis of the vagus, for most of them are males, whilst most of the sufferers from alcoholic neuritis are females, and also it is the exception to find that those who have an alcoholic heart also suffer from peripheral neuritis. Tresilian⁴ in 1898, briefly recorded five cases, in none of which there was an autopsy, but in which there was a rapid pulse, signs of cardiac dilatation, and in three evidence of cardiac failure. His first and fifth cases were undoubtedly examples of neuritis of the vagus, for the patients were women suffering from peripheral neuritis. The nature of the other cases is doubtful, probably they were examples of the alcoholic heart described by the Germans, but

⁴ Tresilian. Alcoholic Dilatation of the Heart. *Edinburgh Medical Journal*, vol. i., 1898, p. 616.

Tresilian makes no reference to this condition. I have read many cases of the alcoholic "beer heart" of the Germans, and inasmuch as other signs of peripheral neuritis are not recorded I think the evidence is all against the supposition that this condition is due to alcoholic vagal neuritis, with which we are perfectly familiar as a sequel of ordinary alcoholic peripheral neuritis. I am afraid we must conclude that we do not know precisely the cause of this disease characterised by cardiac dilatation and hypertrophy, and known as "Tubingen heart," "Munich heart," or "Beer heart."

I will now describe five cases which I believe to be examples of this disease, and if they are, their importance is considerable, for the sufferers certainly did not consume large quantities of German beer. They all took excessively of alcohol, what form four of the histories do not say, while in the fourth case the patient took largely of English beer, but the English hospital patient takes either English beer or spirits, usually both. None of these patients showed any evidence of peripheral neuritis.

CASE 1.—Charles H., æt. 44, was admitted into Stephen Ward under Dr. Hale White at 9 p.m. on June 25th, 1896. He was collapsed, and it was learnt that he had been much addicted to alcohol. The heart-sounds could not be heard and the pulse was imperceptible. His breathing was stertorous; his extremities cold, and his legs œdematous. He died at 3.30 a.m. on June 26th. The post-mortem examination was made the same day. The heart weighed twenty-two ounces. The muscle was pale, and there was a considerable deposit of fat on the right ventricle. The coronary arteries appeared healthy. The right ventricle was thickened; it was pale and streaked with fat. The tricuspid orifice measured five and a half inches; the pulmonary three and a quarter inches. The wall of the left ventricle was hypertrophied being over three-quarters of an inch thick. Muscle pale and fatty. Apex of muscoli papillaries pale, light yellow, and below this deep purple from streaks of hæmorrhage. The mitral orifice measured four and a half inches; there was no endocarditis. The heart showed, when examined histologically, fatty and pigmentary degeneration of muscle fibres. The arteries were not atheromatous. The kidneys were healthy. The liver was very fatty; it floated on water.

CASE 2.—Thomas M., æt. 50, was admitted into Guy's Hospital under Dr. Hale White, November 12th, 1896. He came in on account of swelling of the legs. He was fairly temperate till two years ago, but since then he has been a very heavy drinker. He first began to feel ill six or seven weeks ago. Three weeks ago his legs began to swell.

On admission he has the aspect of a drinker; his hands are tremulous, and he is very short of breath. Temperature 100°, respiration 34, pulse about 120, very irregular, feeble and small. The edge of the liver could be felt three inches below the costal margin. No ascites could be detected, and the spleen could not be felt. There was a trace of albumen, and the specific gravity of the urine was 1024. There was some viscid expectoration and there were some fine râles at both bases. The pulse was so irregular that accurate counting was impossible. The heart's impulse was feeble, but no murmurs could be heard. The cardiac dulness was increased to correspond with the position of the impulse. There was œdema of the feet. The reflexes were all normal. The diagnosis made was:—Dilatation and hypertrophy of the heart from alcoholism; swelling of legs and slight albuminuria secondary to the cardiac trouble. The cardiac dilatation diminished (as shown by diminishing cardiac dulness and shifting in of the impulse). The albuminuria disappeared in a day or two. On November 19th he became so noisy and restless that he had to be removed to the strong room. He soon showed well-marked signs of delirium tremens. His temperature rose to 103°, and he died on November 23rd. During the whole of his stay in the hospital his pulse remained rapid, irregular and weak.

At the autopsy it was found that the arteries of the brain, and the coronary and pulmonary arteries were atheromatous, otherwise the arteries of the body were not noticeably diseased. The lungs were tough and red, and showed general evidence of backward pressure. The liver was nutmeg. The kidneys were large but healthy. The heart weighed twenty ounces. The left ventricle was much dilated and hypertrophied. The valves were all healthy. The tricuspid orifices measured six inches, the mitral four and three quarters.

CASE 3.—Charles H., æt. 34, was admitted into Philip Ward under Dr. Hale White on May 19th, 1903, for œdema of the legs and shortness of breath. His family and personal history is unimportant, except that formerly he used to be rather a heavy drinker. For the last nine months he has only taken a little brandy. He has had no rheumatic manifestation, but he has had gonorrhœa and syphilis. Nine months ago he had to give up his work (that of an engineer) on account of shortness of breath, which had been coming on gradually. At the same time he noticed that his eyes and face were swollen. Since then his trouble has increased, and his shortness of breath is now very marked, and he becomes cyanosed on exertion. He has once coughed up a little blood and is troubled with a cough.

On admission he is well nourished. His respirations are rapid, his lips cyanosed, and he has œdema of the ankles and thighs. The cardiac impulse can be both seen and felt an inch outside the nipple line and in the sixth space. No murmurs can be heard, even when the patient walks up and down the ward, but he cannot do this for long as it brings on severe dyspnœa. There is often a triple beat, and the heart's action is very rapid and often irregular. When he first came in the force of the pulse was fairly good, and the tension normal, but gradually the pulse became feebler and feebler till his death, on June 15th. His liver reached to within an inch of the umbilicus; it was tender and uniformly enlarged. His urine

was considerably diminished in quantity; the specific gravity was usually above the normal: albumen was always present in fair amount. He suffered from diarrhoea. For days before he died he began to cough up much blood, and this continued till his death, which occurred from cardiac failure. He had during most of the time a few râles in his lungs. He was thought during life to be suffering from an alcoholic heart, with secondary enlargement of the liver and congestion of the kidneys.

At the autopsy the heart was found to be uniformly enlarged; it weighed twenty ounces. The valves were normal. The liver was nutmeg. The kidneys were the hard indurated kidneys of heart disease. There was a large pulmonary apoplexy. The coronary arteries were not atheromatous. Histological examination of the cardiac muscle showed nothing abnormal.

CASE 4.—William B., æt. 42, was admitted into John Ward on September 15th, 1903, under the care of Dr. Beddard, and from October 1st till his death in November he was under the care of Dr. Hale White. He came in for breathlessness and swelling of the feet. From the age of 27 he was in the Artillery and was in India for four years; there he had malaria. He stated that he has never had syphilis. Since leaving the Army he has been a coachman and an ostler, and has suffered from time to time from chronic bronchitis. His wife stated that she had known him for thirteen years, during the whole of which time he has been a heavy drinker. He has never been addicted to spirits, but consumed large quantities of beer every day. She did not know how much exactly. In consequence of his drunken habits he had met with many accidents. He had always been a very hard worker, and only drank in his off hours.

Present illness.—Three months ago his breath began to get short and his health became troublesome. Six weeks ago he was still more breathless and was obliged to give up work. During the last five weeks he has been attending as an out-patient. In the beginning of September his legs began to swell. For the past fortnight he has expectorated a great deal, and for the past six days he has hardly slept at all. He has been in bed since September 12th. In spite of this, his feet have continued to swell, and on September 14th his face became puffy.

On admission he looked puffy about the eyes, the cheeks showed dilated venules, and he looked very alcoholic. The legs as high as the knees are oedematous, and over the outer side of the right leg is a mottled light and dark brown scar. The sputum is abundant and contains streaks of blood. The lips are slightly cyanosed. Urine.—Light colour, specific gravity 1022, 2·5 parts per thousand albumen, otherwise normal. Circulation.—Pulse 108, medium tension, artery not markedly thickened. Heart's impulse cannot be seen, but can be felt in the fifth space just outside the nipple; the action is a little irregular, but there is no thrill and no abnormal sounds can be heard. Respiration.—The chest is emphysematous; the respirations are 24. Râles and rhonchi can be heard all over both sides of the chest. Alimentary system.—The liver is enlarged and extends about two inches below the margin of the ribs; it is somewhat tender. Otherwise the alimentary system appears normal. The nervous system also appears normal.

From his admission until the day of his death the patient changed but little, but the signs of bronchitis on the whole got less, and signs of effusion

into the right pleural cavity slowly developed, but the fluid never seemed to incommode him much. The œdema of the legs was very troublesome, and the fluid in them was repeatedly drained away in large quantities by the insertion of Southey's tubes. This always gave him much relief. From time to time he was bled: this, too, appeared to benefit him, but on the whole he slowly lost ground. Many diuretics were tried, but they did not influence the secretion of urine. The urine remained much the same as on admission; a large quantity was never passed, and only once were any casts found. The eyes were examined for albuminuric retinitis, but none was found. Throughout his illness a very striking feature was that he had repeated attacks of dyspnoea quite apart from the breathlessness associated with his cyanosis. These attacks were independent of any exertion or of the state of the lungs, and they looked exactly like the attacks of dyspnoea so often seen in persons suffering from uræmia. He was also at times very drowsy, and this drowsiness, too, resembled that of uræmia. His temperature was usually a little under normal. His pulse was never high tension, and its rate was usually but little over 100, common readings being 100, 104, 108; occasionally, indeed, it was just under 100. The slight irregularity noticed on admission was not subsequently observed, and there were no striking rapid alterations in the rate. Medicinal treatment seem to have very little effect upon him in any direction. On one occasion there was a little blood in the urine, and on the whole the albumen was less than when he was first admitted. On November 5th the patient's condition was much the same as usual in the morning. In the afternoon he got up, as he had been accustomed lately to do, and sat by the fire. He was then suddenly taken very seriously ill. He became quite helpless, and no pulse could be felt at the wrist. He was removed with difficulty to bed, and he complained of severe pain in the calves of the legs, especially the left; he also had much pain in the abdomen—indeed, the pain was so severe that he cried out frequently with it. He was very short of breath and could expectorate nothing, the lower extremities became quite cold, the pulse hardly recovered at all, and he died at 3 a.m. on November 6th, in spite of everything that could be done.

Autopsy.—Heart.—This weighed six hundred and thirty-two grammes, or twenty-two and a half ounces; both ventricles were hypertrophied and dilated, but most markedly on the left side, and the hypertrophy greatly exceeded the dilatation; the heart indeed looked exactly like that of a person who had died from a granular kidney: the valves were all healthy; the left coronary artery showed a single patch of atheroma; the right was healthy; the muscle was a little pale, but not strikingly diseased to the naked eye; the whole of the lower part of the anterior of the left ventricle was occupied by an ante-mortem clot; this was rather larger than a walnut. Histological examination of the cardiac muscle showed it to be normal. Aorta.—This showed no sign of disease anywhere; there was, however, a large ante-mortem clot which extended from a point opposite the superior mesenteric artery to the bifurcation of the aorta; the clot extended into the left renal artery and the superior mesenteric artery. It seemed clear that there had been an embolus from the heart which had got impacted in the abdominal aorta, and this had led to thrombosis and the blocking of the superior mesenteric and renal arteries. Intestines.—The

intestine supplied by the superior mesenteric artery was considerably dilated and of a dark red, and in some cases almost black colour; there was acute peritonitis with recent lymph on its outer surface; on opening the intestine the mucous membrane was very dark red, and showed some submucous hæmorrhages; the intestine supplied by the inferior mesenteric artery was not dilated. Lungs.—There were forty ounces of clear fluid in the right chest and much ante-mortem thrombosis in the branches of the pulmonary artery; there was a patch of pulmonary apoplexy in the base of the left lung; the right was considerably compressed and both lungs were emphysematous. Kidneys.—These weighed three hundred and eighty grammes; there was no evidence whatever of any changes indicating granular kidney. Liver.—This weighed two thousand and thirty-four grammes and appeared perfectly normal. Spleen.—This weighed three hundred and eighty grammes; its lower part contained a large infarct.

CASE 5.—A publican, æt. 60, seen September, 1903, with Dr. F. H. Bence. He had drunk hard, and when we saw him he was dying. He was sitting up, very short of breath, with a feeble pulse of 150. The cardiac sounds were weak. Some emphysema made the estimation of the cardiac dulness uncertain. Save for the emphysema, the lungs were healthy; there was no albumen in the urine; the arteries were not thick; the liver was somewhat enlarged; there was very little œdema of the feet, and no sign of peripheral neuritis. No post-mortem examination could be obtained, but the man's condition strongly suggested an alcoholic heart.

The clinical characteristics of this disease appear to be that the patients are nearly always males, the proportion of men to women being about ten to one. In Germany it is naturally especially common among those who have opportunity of drinking much beer, such as students, waiters, brewers, innkeepers and commercial travellers. Krehl suggests that it is especially common among beer drinkers who do much muscular work, for he believes it to be especially frequent among students who fence. One of the first symptoms to attract the attention of the patient is shortness of breath; this often becomes so marked that he can hardly take any exercise. One of the five patients, namely, the third, whose case is recorded here, was quite seriously dyspnoëic if he walked half the length of the ward. The dyspnoëa was also serious in our fourth and fifth patients. The intensity of the dyspnoëa may vary from time to time. This was well shown in our fourth patient. On examining the patient it is usually found that he has a rapid, sometimes a very rapid, weak pulse, which may be irregular but is often not, and the rate of the pulse is

greatly increased by exertion which in health would hardly affect it, and in the same way slight exertion makes it especially weak and irregular. It was a remarkable thing about our fourth patient that after his admission his pulse was never irregular, very rapid or weak. The cardiac impulse is feeble and if dilatation is advanced the impulse is diffuse. As the case progresses the cardiac dulness is found to be increased both to the right and left and the impulse is displaced downwards to the left. The first sound is diminished in loudness, the second may also be feeble or it may be accentuated and even reduplicated. As a rule no murmur can be heard, but later on when the disease leads to marked cardiac dilatation and consequent failure of the mitral valve to meet, a systolic apical murmur indicative of mitral regurgitation may be heard. These patients, often quite early in the course of their illness, may complain of a sense of oppression or even actual pain in the chest, of palpitation and of a fulness in the epigastrium. These symptoms and the shortness of breath lead to disturbed sleep, and very often sufferers from this form of heart disease, like those suffering from other varieties, wake up with a sudden start shortly after they have fallen asleep, and when they awake in this way they feel great respiratory distress.

It is surprising how ill the patient may be before any signs of backward engorgement of the venous system show themselves. He may be so short of breath that he is confined to his bed, his pulse may be weak and beating at the rate of 120 to the minute without any backward signs in the venous system, and he may even die before they become at all striking. Frequently, however, they supervene, and then they are such as are commonly met with in heart disease, such as œdema of the feet, an enlarged nutmeg liver, lividity, hæmoptysis, bronchitis, œdema of the lungs, scanty high-coloured urine with a little albumen. They are well shown in our fourth patient. It is said that shortly before death the pulse may be abnormally slow.

This is not the place, nor is it of much profit to discuss the diagnosis in great detail, for as a rule mistakes in diagnosis are best avoided by remembering their possibility rather than by elaborate lists of distinctions. The history of excessive drinking

and the absence of a history of rheumatic fever help in distinguishing from valvular disease of the heart. The pulse, the kind of murmurs, if any, and the whole aspect of the case show it is not one of aortic disease, but towards the end the case may much resemble one of mitral endocarditis with regurgitation. In the earlier stages, however, the rapidity of the pulse and the severity of the dyspnœa, without any sign of mitral disease, will usually enable us to make a correct diagnosis. Probably chronic interstitial nephritis gives rise to the greatest difficulty, but there are many points of distinction although in some cases it is almost impossible to come to a diagnosis. It was very difficult to make a certain diagnosis in our fourth case, for the considerable albuminuria, the excessive œdema, the pleural effusion and the character of the dyspnœa caused the case to appear very like one of chronic Bright's disease.

Myocarditis is by some authors put down as a condition to be distinguished from the alcoholic heart. But the difficulty can hardly arise in practice if the myocarditis is that which follows one of the specific fevers, *e.g.*, rheumatic fever, diphtheria, scarlet fever, typhoid, typhus, pneumonia or influenza, for the history will put us on the right scent. Nor is there likely to be any difficulty with regard to that form of myocarditis which is associated with pericarditis. Chronic myocarditis or fibroid disease of the heart is usually syphilitic. It is not common, nor are alcoholic hearts common, but as far as I have seen, the history and the severe dyspnœa and rapid pulse of the alcoholic heart should be of help in making a diagnosis. Fatty degeneration of the heart, if general, is usually associated with general anæmia, wasting diseases, as phthisis, or cancer, or with infective diseases, in which case the history will put us on the right track, but it may be due to chronic alcoholism and then may be difficult to dissociate from the alcoholic heart disease here described, but the fatty heart is not hypertrophied to the same extent, the sufferers are liable to seizures of sudden cardiac failure, and the pulse is not so persistently rapid, as the alcoholic heart.

Diseases of the coronary vessels are given amongst those conditions which have to be diagnosed from alcoholic heart disease,

but when the long-standing congestion of the coronary veins, which is one of the backward effects of valvular insufficiency, causes induration and fibrosis of the heart, we shall have the presence of the valvular disease to guide us, and when disease of the coronary arteries is merely part of a general arterio-sclerosis the other evidence of this condition will guide us. Atheromatous disease of the coronary arteries or thrombosis of them will lead to serious and obvious fatty, fibroid and degenerative changes in the myocardium, but here again the history of alcoholic excess and the size of the heart will help us, and I should be inclined to lay much value on the rapidity of the pulse.

The post-mortem appearances of an alcoholic heart are striking, for there is considerable hypertrophy of both sides. In our first case the organ weighed twenty-two ounces, in the second twenty ounces, and in the third twenty ounces, and the fourth twenty-two and a half ounces. Bauer and Bollinger give the weights of many hearts of patients dead of this disease, the heaviest weighed seven hundred and ninety grammes, or about a pound and a half, and several of about twenty ounces are given.

By the time death has taken place there is dilatation as well as hypertrophy. Sometimes there is associated alcoholic fatty degeneration shown by yellow striation; this was very evident in our first case, and here some streaks of hæmorrhage could be seen, but in very many cases no fatty change can be seen. The muscle is firm and hard. The majority of authors believe that no important histological changes can be found, and that was so in our third and fourth cases which were examined histologically, but some authors attach much value to the fact that the muscle fibres are widened, the nuclei are increased in size, and the fibres show fragmentation. Aufrecht⁵ even goes so far as from these changes to call the condition alcoholic myocarditis, but this appears to be certainly wrong. Many observers believe that these appearances are either produced after death or in the agony, and they are undoubtedly met with in other diseases besides alcoholic heart disease, therefore we shall probably be right if with Krehl we do not allow them to be of much

⁵ Aufrecht. *Deutsche Archiv. f. Klin. Med.*, 1895, S. 615.

value in connection with alcoholic heart disease. Some authors have described patches of intestinal inflammation scattered throughout the heart, but they are by no means constant. Albrecht is inclined to attach much importance to them, but they cannot be produced in animals by the administration of absolute alcohol, and Krehl suggests that when they occur they owe their presence to the fact that the alcohol so lowers the resistance of the body that the heart easily becomes the prey to bacterial invasion. The conclusion, from my own cases and from what I have read, is, I think, that at present we know of no histological changes which are characteristic of alcoholic disease of the heart.

With regard to the post-mortem appearances of my own cases. In none of them was there any renal or valvular disease to account for the cardiac hypertrophy. In the first case this reached twenty-two ounces and there was fatty degeneration of the heart, but this is to be ascribed to the alcohol, for the coronary arteries were perfectly healthy. The liver was extremely fatty. In the second case it might be urged that the atheroma of the coronary arteries were the cause of the trouble, but this atheroma was not sufficient to call for any particular comment from the demonstrator of morbid anatomy. To the naked eye, at any rate, there were none of the fatty, fibroid and degenerative conditions characteristic of disease of the coronary arteries, and during life the symptoms were so striking that the patient was believed to be suffering from an alcoholic heart, and after death this organ was found to weigh twenty ounces. Unfortunately no mention is made in these two cases as to whether the right side was hypertrophied as well as the left, but in the third case the heart was uniformly enlarged, and both the symptoms during life and the condition after death showed a typical alcoholic heart. The fourth case showed at the post-mortem a typical alcoholic heart.

Finally, I should like to suggest that in the future especial attention should be directed in our post-mortems in Great Britain to seeing how frequent this disease is with us. It is

notorious that alcoholic subjects bear pneumonia badly. May it not be that they are frequently sufferers from an alcoholic heart? I strongly suspect that this form of heart disease is more frequent than is commonly supposed, and is often in various fatal illnesses a powerful contributory cause of death.

A CONTRIBUTION TO THE HISTORY OF THE INTRAVENOUS INJECTION OF DRUGS;

TOGETHER WITH AN ACCOUNT OF SOME
EXPERIMENTS ON ANIMALS WITH ANTISEPTICS;
AND A BIBLIOGRAPHY.

BY J. M. FORTESCUE-BRICKDALE, M.A., M.D.

(THESIS FOR THE M.D. OXON.)

THE history of the intravenous injection of drugs divides itself naturally into four fairly well marked periods of activity, separated by intervals of varying length during which very little work of this kind is recorded. The first period may be said to begin in 1656, and to end with the end of the seventeenth century. For nearly one hundred years from that time the practice seems to have lain dormant, though towards the end of the eighteenth century some isolated experiments were performed. In 1814, however, attention was again called to the subject by Barou Percy, and for over fifteen years a considerable amount of clinical and laboratory work was accomplished. The method continued to occupy a place in medical annals during all the first half of the nineteenth century, but mainly in connection with the injection of saline fluids, and it was not until 1869 that the injection of drugs for their therapeutic action again came into prominence. This third period hardly extended beyond 1876, and from that date until 1890 the literature on the subject is sparse.

The transfusion of blood and its lineal descendant, the infusion of saline fluid, have a history of their own, and will only be considered here in connection with two of the above-mentioned periods. The intimate connection which transfusion has with the origin of the injection of drugs seems to warrant a few allusions to the former process in the account of the early history of the latter, and a short reference to the nineteenth century work on the injection of salt solutions can hardly be avoided in view of the fact that the earlier physicians of that period attributed therapeutic importance to the substances in solution apart from the vehicle in which they were dissolved.

The Egyptians¹ are said to have practised transfusion of blood, but this idea may have arisen from Pliny's statement that the Egyptian kings bathed in water tempered with human blood as a remedy for elephantiasis. The story of Medea and Æson is taken as evidence that the Greeks were acquainted with the process, and Herophilus is said to have practised it; there is, however, no allusion to it in Marx's edition of his writings. Probably the earliest record of transfusion is to be found in Muratori's account of the death of Innocent VIII. in 1492. He tells how a certain Jew promised to cure the Pope with the blood of three healthy boys. These three, however, died soon after, and, says the author, "*Iudæus quidem fugit et Papa sanatus non est.*"

De Colle, of Padua, alludes to transfusion in 1628. He has been credited with the actual performance of the operation, but all he says is, "*Dum si quis sanguis a vena exitiens iuvenis, admodum salubris, per fistulam calens in venam senis permeet, dum hic sanguis potest reparare humidum et temperamentum ergo etiam si sanguinem iuvenis obtineret, viveret ut iuvenis.*"

It seems certain from contemporary evidence that the first experiment with the intravenous injection of drugs was performed by Christopher Wren when Savilian professor of Astronomy at

Oxford. Bishop Spratt² says: "He was the first author of the noble anatomical experiment of injecting liquors into the veins of animals, an experiment now vulgarly known; but long since exhibited to the meetings at Oxford; and thence carried by some Germans and publish'd abroad." Ettmüller and Purmann also attribute to Wren the earliest experiment on animals. The date is stated by Oldenburg³ to have been about 1659, but evidently owing to the pretensions of J. D. Major, Timothy Clarke,⁴ in a later communication to the Philosophical Transactions, corrects Oldenburg's date and definitely fixes the year as 1656. The experiments, at which Boyle and Wilkins assisted, were made on "pretty big and lean dogs," in order to get large, prominent veins; and the apparatus used was composed of quills to which a small bladder was attached "like a clyster." An engraving of a similar instrument can be seen in Major's "Chirurgia Infusoria." Opium and Crocus Metallorum were the drugs used; the first stupified the dog but did not kill him, the second caused him to "vomit up life and all."⁵

This experiment was repeated with similar results at Pisa by Carolo Fracassato in 1658.

The question as to who was the first to attempt intravenous injection on the human subject was the cause of much contemporary controversy—a controversy which lasted, Purmann says, from 1664 to 1668. Clarke's evidence⁶ is in favour of Wren, though, as the experiment was not carried out in its entirety, it is doubtful whether it should be allowed to rank. It appears⁸ that in the year 1657, a Foreign Ambassador at the Court of St. James (said by German authors to have been Prince Rupert, but by Clarke to have been a Burgundian Prince) taking an interest in the proceedings, offered "An inferiour servant of his, a malefactor" as the requisite *corpus vile*. The man, however, says Oldenburg, in the middle of the operation "either really or craftily fell into a swoon," and the experiment had to be discontinued. The drug used was Vinum Emeticum.

In 1662, J. D. Major successfully injected a man, but he gives no details of the operation. He is described by his contemporaries as something of a charlatan, and his style certainly lacks

the "Modestia" which he advertises on his title page. Haller says of him that he was more given to the formulating of theories than to the accomplishment of practical work. His theory on this occasion seems to have been that in disease the condition of the blood prevented sweating, a natural curative reaction such as occurs in the crises of fevers. He thought the injection of drugs diminished an undue viscosity of the blood and so allowed Nature to throw off the *materies morbi* in her own way. It is conceivable that perspiration may have accompanied many injections, as they were frequently painful. In the "Prodromus" Major gives certain practical directions, of which one is interesting. He says of the patient's skin before the incision "*vino callido aut aqua sambuci cum spiritu vini camphorato foveatur*"—a procedure calculated to attain some degree of asepsis.

In 1664, Caspar Scotus is stated by Hemman to have injected dogs with wine and purgatives, but I have not seen the original account of the work.

Escholtz (or Elzholtz) published a book in 1665 containing an account of the new method, and giving details of three cases treated by himself. The patients were soldiers in the Prince of Brandenburg's body-guard. The first suffered from a chronic ulcer on the foot, for which Escholtz injected Aqua Plantagenis into the crural vein; the second, who had a fever, was bled, and subsequently injected with a spoonful of Aqua Cochleariæ; the third, who appears to have come to the surgeon for a periodic precautionary bleeding, was also injected with the same drug without apparently being conscious of the operation. These are all reported as having been successful cases.

M. Hoffmann, of Altdorf, is stated by several writers to have been the inventor of infusion, but his experiments seem to have been about contemporaneous with those of Escholtz. His "Synopsis Institutorum Anatomix et Medicinæ," published in 1661, contains no mention of transfusion or infusion, though he appears in 1667 to have written to Ettmüller to the effect that he had been employing the latter method for some years.

In 1666, Lower performed the first successful transfusion of blood, Denis, of Montpellier, following him in 1667.

Fabricius*, in 1666 describes, in a letter to Boyle, three cases treated by him at Danzig. The first was a soldier with syphilitic exostoses to whom he gave "*Resinæ Scammonii gr. vii. dissoluta in Ess. Ovajac ziii.*" The exostoses rapidly disappeared. The other two were epileptic women who each had "*Resina Gialap.*" dissolved in the spirit of *Lilium Convallarium*. The fits had not recurred two months later, but, as Ettmüller remarks: "*radicaliter an curata sit nescio.*"

Smith (or Schmidt), of Hamburg, in the following year communicated to the Royal Society an account of five patients whom he treated in consultation with an old practitioner named Schoeffer. Two women suffering from syphilis received purgatives, probably Jalap, which Purmann says was the favourite drug for infusion. One died, a result which Smith attributes to her disobedience to orders in going too soon into the cold air, and taking no care as to diet. The other is said to have been cured. The remaining cases were given an "alterative." The first of these was a man lame with the gout, who said he was quite well the next day. As the operation was invariably followed by a rigor and vomiting, it is possible that he preferred the gout to a repetition of the treatment. The second was an "extremely apoplectical man" whose fits forthwith ceased, while in the third case, one "reduced to extremity by that odd distemper *Plica Polonica*," the ulcers subsequently began to heal. At the time of writing all these three had been at work "any time this three weeks."

M. Ettmüller, in 1668, published an important dissertation reviewing the subject as a whole, and adding an account of his own work, which consisted in the injection of spirit, water, opium, tartar emetic and other substances into animals. He gives no details as to his methods but concludes that infusion

* The Philosophical Transactions do not mention the drugs used, and the *Journal des Savants* (1667) calls the injection "*Liqueur Purgative.*" This led Champignon (*Gaz. Méd. de Paris*, xlv., p. 241, 1874) to the conclusion that a mercurial preparation had been used. Ettmüller, however, gives the exact prescriptions.

is applicable to nearly all diseases. Pregnant women and newborn children, however, are regarded as bad subjects.

Matthieu Godefroi Purmann in his work on surgery, originally published in 1683, devotes a chapter to the "*Chirurgia Infusoria*," as it had been christened by Major. "At Halberstadt, in 1679 and 1680," he says, "I injected two patients who had for many years been troubled with the falling sickness [using] *Sp. grani et Rad. Peoniæ ʒj.* mixed with *sp. Liliorum Convall.*, who were both perfectly cured with it. But I had another woman patient whom these medicines would not wholly prevail upon, for though the epilepsy seemed to vanish for three months, yet after that it returned again, wherefore I injected twice *Aq. Hirundinæ*, mixed with *Sal Volatile Succin.*, after which the woman was never troubled with it again." He was injected himself on two occasions, once for a "sort of leprosie," without any apparent result, and later on for a fever which *Aqua Cardui* "cured" in less than two days' time. Purmann gives a list of the drugs then used intravenously which is certainly fairly comprehensive. It includes:—*Aq. croci metallorum*, opium, *aq. chrysalea*, *spiritus nitrosi vel vitrioli*, oil of sulphur, arsenic, plantan water, *aq. cardui benedicti*, *aq. marjorænæ*, *aq. cochleariæ*, snail water, *sp. salis ammoniaci*, *sp. salis essentificatus cornu cervi* (with or without *sp. vini camphoratus*), amber, cinnamon, *confectio alkermet*, *sal volatile oleosum silvii*, *sal volatile cornu cervi*, *sp. lilior. convall.*, *sp. cinnamoni cum oleo succini*.

Lanzoni experimented on dogs, as did another Italian, Bagleri. Antonio Vallisnieri the elder treated a case of otter-bite with an injection of spirit of hartshorn. Moeller cured a soldier suffering from syphilitic ulcer of the legs in two days with an injection of resin of jalap dissolved in mayflower water, and Chilian, in 1718, cured the same disease by "*Balsam of Mecha and spiritus ligni*." Many other cases are recorded, but the above may be taken as fairly typical of the remedies and the results.

At the beginning of the eighteenth century, owing to various accidents, mainly in connection with the cognate treatment of transfusion, the practice fell into disrepute, and the pioneers failed to find active successors. Freind, whose complete works

were published in 1773, after his death, tried various experiments on animals with mineral acids and caustics; he was also the first to demonstrate the danger of the entry of any large quantity of air into a vein, describing carefully the frothy blood found *post-mortem* in the distended ventricle. On the other hand, Pierre Dionis, the professor of surgery in Paris, who died in 1718, attacks both transfusion and infusion alike, and warns his students against having anything to do with either, though he admits that the latter is the less likely to do harm. In fact, though quoting fatalities resulting from transfusion, he fails to mention any connected with the sister art, which seems to show that they were not numerous. The only fatal issue I have found recorded during this period is the syphilitic woman treated by Smith.

Upon the basis of a humoral pathology the early operators certainly had the courage of their convictions, but, beyond laying a foundation for future observers by demonstrating the possibility of the procedure, they cannot be said to have accomplished much, while the absence of method in experiment and detail in reporting deprives their work of anything more than antiquarian interest.

Till the end of the eighteenth century very little is heard of infusion, whilst in many countries transfusion had been made illegal. Sprægel, in 1753, delivered an inaugural address at Gottingen on the subject, and in 1770 Lieberkuhn and Laeseke, Koehler, Kopf and Schmucker reported successful cases in which tartar emetic in doses of six to four grains was injected intravenously when foreign bodies had become impacted in the larynx. In 1775, J. A. Hemman injected quinine, musk and other drugs into animals, and two years later Regnaudot, of Guadeloupe, published some cases in which he had injected guaiacum, gum arabic and other substances with no particular success. In 1782, Fontana⁷, in a letter to Gibelin, mentions that owing to reports appearing in the Italian press of marvellous cures obtained by the infusion of ammonia after snake-bite, he instituted experiments on twelve animals, lambs and rabbits being chosen. The

maximum safe dose he previously determined at twenty to thirty minims, but this failed to cure the poisoned animals.

With the work of Fontana, Magendie, Nysten, Bichat, Orfila, Daniel, Gaspard and Dieffenbach,⁸ however, came a revival of interest in infusion, which was further stimulated by the writings of Baron Percy who contributed an article on the subject to the *Dictionnaire des Sciences Médicales* in 1818. In 1802, Paul Scheel began publishing a periodical work devoted solely to transfusion and infusion, and after his death Dieffenbach continued the publication, carrying it down to 1827. The toxicological side of the work of this period will not be discussed here. The following investigations, however, may be mentioned as giving results of clinical importance: Nysten, Dieffenbach and Bichat's work on the dangers attending the introduction of air into veins; Gaspard's experiments⁹ demonstrating the impracticability of the use of oily injections for therapeutic purposes; and Magendie's observation that rabid animals require more than the usual amount of a sedative injected intravenously for the production of narcosis.

As experiments in practical medicine, Dupuy's injections, published in 1815, may be briefly described. In a horse suffering from gastric disturbance he injected five grains of tartar emetic, which produced a copious evacuation and some general depression, but the animal is said to have been benefited by the treatment. He also tried "subcarbonate" of ammonia in a case of glanders, but it does not appear that the horse's condition was in any way improved. Among other substances experimentally used, corrosive sublimate¹⁰ in a one drachm dose is recorded as having killed a horse.

The *New England Journal* published in 1820 a series of experiments on animals with tartar emetic, cantharides, etc., but the article, which is unsigned, is of no great interest. Daniel gives the fullest account of the subject up to date, with a fairly exhaustive list of clinical cases, but his original work is mainly devoted to the injection of pus, urine, dirty water, etc., substances of no therapeutic interest. Among the few drugs with which he

experimented, perchloride of mercury is the most interesting; of this he found a quarter of a grain killed a middle-sized dog.

Dr. E. Hale, of Boston, may perhaps claim to rank as the boldest experimenter of this period. In spite of operative difficulties connected with finding a suitable vein, he succeeded in injecting into his own circulation $\frac{3}{4}$ ss. of castor oil. He gives a detailed account of his very unpleasant experiences, and sums up against infusion as a general therapeutic method. It seems surprising that circumstances did not compel him to limit his protest to the length of an epitaph.

Coindet relates how in 1823 he treated a case of hysterical fits in a girl by the intravenous injection of the best part of the soluble matter contained in a scruple of powdered opium. He is, however, obliged to admit that the fits soon returned. Later on change of air and diet seem to have effected a cure. A similar case in which there was a history of worms was treated by Méplain with an injection of tartar emetic; subsequent writers, however, did not fail to point out that a stomach tube would have been better had he possessed the skill to use one. The vomiting which ensued seems to have stopped the fit, and according to Méplain to have brought up the worm.

The main clinical interest, however, in this period centres in the attempts to cure tetanus and hydrophobia by intravenous injections. Baron Percy, at the Hôpital de l'Abattoire at Ménilmontant, treated, in 1814, two series of cases of tetanus with injections of opium and stramonium, the latter producing a "kind of total paralysis favourable to the cure of tetanus." He gives no details of these cases, but merely says that in the first series three out of five patients recovered, and in the second five out of eight.

Magendie,¹¹ in 1823, after various experiments on animals, both rabid and healthy, injected opium in a case of hydrophobia occurring in a young man, who, however, died. He also treated four cases with injections of warm water, which stopped the convulsions for a short time, but did no further good. Gaspard¹² failed to attain even this measure of success, a result attributed by Magendie to the facts that he omitted the preliminary bleeding

and then injected only ten instead of twenty ounces of water. A case of hydrophobia is recorded in the *Lancet* of 1824, treated at Guy's Hospital, in which warm water was injected after a copious bleeding, but the patient sank and died almost immediately afterwards. Brandreth, in 1825, tried to cure hydrophobia with injections of morphia. The dose was from twenty-four to thirty minims of a solution of the acetate daily over a period of four days, at the end of which time the patient died in convulsions. The strength of the solution is not stated.

Magendie, in 1828, also treated cholera with injections of an alcoholic solution of camphor. He records thirty-two cases, all of which died. Delpeche, at Montpellier injected forty minims of Sydenham's laudanum in three cases without influencing the course of the disease, though the patients felt more comfortable for a time. Blandin mentions two cases which he treated similarly with protoxide of nitrogen; the only detail concerning them which he gives is that they both died.

In reviewing the clinical work of this period two things will at once be apparent: firstly, that the indiscriminate application of infusion to all diseases had been abandoned; and secondly, that a very small measure of success attended most of the work. The first change was no doubt due to the advance in pathological knowledge; infusion now had a definite sphere of action, and the objects of experimenters were either to escape the digestive action of the stomach on the drugs used, or to circumvent a want of absorptive power on the part of the mucous membranes. These two lines of thought led naturally to the application of the method to very diverse conditions. As to the reports of the cases and the scientific value of the results, it cannot be said that they show a very marked advance on the work of the previous period. Where a detailed report is given, careful consideration often throws considerable doubt on the diagnosis; tetanus, for instance, was a term often used loosely to describe any violent spasms from whatever cause arising, while Magendie's case of hydrophobia was in all probability one of acute mania. Here, moreover, the account of the autopsy shows that death was due to general pyæmia started by one of the many prelim-

inary bleedings to which the patient was subjected. Dangers of this sort were perhaps often masked by the fact that the method was mostly applied to usually fatal diseases, but Dronsart, whose memoir on the whole subject is a masterly piece of contemporary criticism, was probably hardly too pessimistic in writing, "*je suis arrivé à la conclure que, dans la très-grande majorité des cas, le moindre inconvenient de l'infusion c'était son inutilité.*"

Perhaps this essay represented a very general feeling among medical men, for very little work with the exception of infusions of saline fluids was done during the next forty years. Duchaussoy, in a monograph on cholera published in 1855, quotes six cases in which strychnine sulphate was given in doses varying from 3 mgm. to 2.5 cgm. ; only one recovered, and then apparently not owing to the injection. When any reaction to this treatment was observed the patients died in convulsions immediately. Two cases were treated with 20 and 30 cgms. of quinine sulphate respectively, of which one recovered. Duchaussoy also quotes a case in which Jaenichen, of Moscow, learning that acetic acid was present in choleraic dejecta, injected that drug—without appreciable effect. With regard to the saline injections, the best account of which is Hayems', it may be said briefly that various strengths and quantities were tried. About .6 per cent. was the usual strength. Jacoud's table of cases treated by this method gives a mortality of 69.55 per cent. among 278 patients, which is rather high. Hayems had a mortality of 30 per cent. in one series and 33 per cent. in another, which, as the cases are said to have been severe, is low. Duchaussoy himself was hardly satisfied with the treatment which afterwards developed so usefully in other directions; he consoles himself, however, with the just reflection, "*Rarement la médecine a le pouvoir de ranimer les cadavres.*"

Two theses on the subject of intravenous injections mark the third historical period, one by Ladévy-Roche, in 1870, and one by Sallées, in 1874. Neither of them attain the level of Dronsart's work in 1824, and both are tinged with an optimism not perhaps unnatural at the beginning of an era of renewed

activity. Although, since Dronsart wrote, Duchaussoy and others had paid much attention to the occurrence of phlebitis after infusion, and had recorded one fatal case among many slight ones, Ladévy-Roche is at some pains to defend the practice against the charge of being dangerous to life or health, although there is little evidence that as yet there was much improvement in technique. Sallées, whose work is the more practical of the two, divides that portion of his thesis which deals with contemporary developments into four sections:—

1. Saline injections in cholera.
2. Ammonia injections in snake-bite.
3. Chloral injections in tetanus and hydrophobia.
4. Chloral injections for producing general anæsthesia.

The first of these has already been dealt with, the others include nearly all the work of this period, a few miscellaneous experiments by Halford and some applications of ammonia to other conditions constituting the remainder.

In 1869, Dr. G. B. Halford read before the Medical Society of Victoria a paper in which he gave an account of some experiments on animals. Of these experiments interest attaches to those concerning the injection of quinine and carbolic acid. Dogs were used, and as much as eight grains of quinine in an ammoniated tincture, and 4·7 minims of pure carbolic acid dissolved in glycerine were injected. No ill-effects were observed beyond some drowsiness and vomiting after the former drug, and transient convulsions after the latter. A control dog injected with glycerine alone had no convulsions. These experiments, together with a suggestion that the method might be applied to syphilis, rheumatism, leprosy and scurvy, foreshadow to a certain extent the work of more recent experimenters.

The major part of Halford's paper, however, is devoted to detailing his treatment for snake-bite. Ammonia locally or by the mouth had long been a recognised remedy in these cases, and, as has been seen, it had been tried intravenously in Italy nearly one hundred years before. Between the appearance of this paper in 1869 and the year 1874 a considerable controversy took place, the literature of which is scattered up and down the

medical periodicals of the time. During these years Halford collected twenty-three cases in which his treatment was applied, nearly always with a successful issue. He himself gives a detailed account of each, some also being separately reported by others as they occurred. Indian observers, on the other hand, headed by Fayrer, had very little success in their experimental work, and a committee appointed in 1873 threw doubts on the efficacy of the treatment. Originally, in 1869, Halford was able to report eleven successful cases, in one of which, however, sloughing occurred at the site of injection. He also asserted that animals experimentally poisoned by the bite of venomous snakes recovered under treatment with ammonia injections. Fayrer, repeating Halford's experiments with cobra venom, could only find that death was somewhat delayed. It was suggested that three sources of fallacy existed—firstly, that some of the patients treated by Halford had been bitten by non-venomous snakes; secondly, that in others the venom had been ejected otherwise than into the wound; and thirdly, that in others again the collapse observed was due to alcoholic poisoning induced by over-energetic “first aid.” In 1870 Halford instituted further experiments, injecting as much as four and a half drachms of liquor ammoniæ in divided doses into the ventricle of dogs poisoned by an over-dose of chloroform, without any ill effects which could be detected *post-mortem*. Five fresh cases of snake-bite were also reported, one of them again followed by severe sloughing, but as the dressing applied was vinegar poultices possibly some of the destruction of tissue might have been avoided by the employment of better methods. In 1871, three more cases occurred, with two deaths, the latter attributed by Halford to the fact that, as the early symptoms were slight, delay occurred in applying the treatment. With regard to this, it may be noted that although it is asserted that Halford never claimed that ammonia was a specific antidote, these cases seem to show that he had some notion that it was. A mere stimulant would not have been necessary until the signs of collapse supervened. In 1873, Webb drew attention to several cases of severe ulceration following intravenous and hypodermic injections of

ammonia. In 1873, the Indian Committee, which had been appointed at Fayrer's instance, reported that they could not agree with Halford's views. No diminution in the coagulating power of the blood or increased leucocytosis, such as Halford had described, were observed by them in cases of snake-bite; and Fayrer, in some introductory remarks, pointed out that as the poison was rapidly eliminated by the kidneys, artificial respiration was often enough to keep the patient alive. Halford's reply consisted of a series of articles contributed to the *Medical Times*, giving an account of all the snakes found in Australia, the commonest of which are undoubtedly venomous, and detailing twenty-one cases in which his treatment had been carried out with success. In reply to those who doubted the virulence of Australian snakes, he stated that animals artificially injected with venom died as rapidly as those similarly treated in India. In the following year he again reported two successful cases. In 1876, however, a committee appointed at Melbourne to investigate the matter failed to cure dogs experimentally poisoned, though admitting that in the human subject Halford's treatment had been beneficial in some cases.

Subsequent investigations seem to show that the discrepancies between the results of these various observers are due to the fact that leucocytosis is preceded by a great destruction of leucocytes, more noticeable if the venom is introduced directly into the circulation. The coagulability of the blood is also variously influenced according to the method of injecting the poison. Moreover, some confusion no doubt arose from the assumption that the poison of the Australian snakes was identical with that of the cobra; in cases of poisoning by the former artificial respiration is less successful. It is not now held that ammonia has any direct antidotal action.

The stimulating power of ammonia intravenously injected was well observed in two cases recorded by Halford, one of chlorodyne poisoning and one of chloroform poisoning in a man already much depressed by alcoholism. Three very interesting cases of severe traumatism and shock were treated with ammonia injections by Tibbits, of Bristol, in 1872, one of which eventually

recovered; while in 1879, Hamilton reported two cases of poisoning by alcohol and carbolic acid respectively in which similar treatment succeeded in reviving the patients after other means had failed. Griswold, in the same year, repeated Halford's experiments on chloroformed dogs with identical results.

Oré's experiments with chloral took their origin from a case of tetanus¹⁴ in which, following some earlier experimenters, he tried to quiet the spasms by infusion, substituting chloral hydrate for the opium formerly used. The dose was nine grammes dissolved in ten grammes of water. The injection was repeated in a short time, and not only did the spasms cease, but so profound an anæsthesia resulted that Oré was able to remove one of the finger nails in order to complete the treatment of the infected wound. On the two succeeding days Oré repeated his injections, and the patient eventually recovered. This case occurred in 1874. A second case (Cruveihlier's) was, however, less successful. The patient died during the anæsthesia having received twenty-nine grammes of chloral hydrate in five days. Suppuration at the sites of injection and coagulation of the blood were found *post-mortem*. L'Abbé's case was also unsuccessful; though only one injection of ten grammes was given the patient became very cyanosed and had to be revived by an electrical machine. Shortly afterwards the spasms returned and death occurred. Tilleaux also tried the treatment, and Boucquoy applied it to hydrophobia, both with unfavourable results.

Meanwhile it occurred to Oré that as he had been able to tear off a patient's nail under the influence of chloral hydrate, this substance might be made to replace chloroform as a general anæsthetic. As a matter of fact, Noire, in 1869, had employed it for this purpose, seventy-five grains having been given in divided doses by the mouth. Noire amputated the leg under the resulting anæsthesia, but the coma and convulsions which followed were so alarming that the operator abandoned the method. Oré, however, injected chloral hydrate twenty-five times with success, using a solution neutralized with bicarbonate of soda, which, he stated, prevented coagulation. Deneffe and Van Wetter had nine cases in Belgium, and Languelongue

three at Bordeaux. Bougué is mentioned by Eulenberg as having confirmed the usefulness of the method. Major operations, such as amputation through the hip-joint and removal of a carcinoma of the rectum, were performed. The dose was from five to ten grammes, injected slowly, which maintained anæsthesia for about half an hour. Between 1876 and 1879 various experimenters demonstrated the dangers of Oré's method, which had already been emphatically condemned by Laney and Gosselin. Ranke demonstrated the coagulating effect of chloral hydrate on muscle. Tizzoni and Fogliata showed that it was a hypnotic but not a true anæsthetic except in maximal doses, that the susceptibility of different individuals varied enormously, that it was very liable to cause phlebitis, and that it might suddenly arrest the heart in diastole. These observations were confirmed by Franck and Traquest and by Troquart; and later Vulpian showed the dangers of cardiac and respiratory failure from reflex stimulation or a slight increase in the dose of the drug. The process of Oré therefore fell into disuse.

These two interesting if shortlived experiments were, of course, conducted on lines far in advance of the work of any previous period. Based on wider knowledge of the action of drugs and supported by more carefully planned experiments, the criticism which they evoked and the further researches to which they gave rise before they were abandoned, are not their least useful or least remarkable results.

Between 1876 and 1890 very little notice was taken of infusion. Many experiments on animals with pus and other organic substances were carried out in the earlier years of that period but their object was not therapeutic. A curious claim is recorded in the *Lancet* of 1886, by Dr. Avendado, of Lima, who describes the intravenous injection of ammonia in anthrax, and in addition to this states that to Peruvian physicians is due the honour of having been the first to introduce the injection of chloral and ammonia in tetanus, of ammonia in septicæmia, and of capsicum in yellow fever.

A certain amount of laboratory work should, chronologically, be mentioned here, but a more appropriate place in connection with later experiments will be found for it hereafter.

The essential characteristic of the work of the fourth and last period in the history of intravenous injections, which differentiates it from all its predecessors, lies in the bacteriological knowledge upon which much of it is founded. In 1870, Ladévy-Roche had complained of the uselessness of investigations having for their object "*connaître les effets des injections de spores de cryptogames dans les veines du lapin,*"* but in twenty years these tentative proceedings had given place to a more fruitful form of research, and it may be said that almost, if not quite, the most important question in contemporary experiments with the direct injection of drugs turns on the point as to whether or no pathogenic organisms can thereby be destroyed or prevented from increasing.

It will be found convenient to classify the work of the last twelve years in the following manner:—

- I. Injections of drugs intended to increase the resistance of the patient to infection:—
 - (1.) Landerer's method.
 - (2.) Gautier's method.
- II. Injections of drugs intended to destroy or damage the cause of the disease:—
 - (1.) Bacelli's method.
 - (2.) Maguire's and Ewart's method.
 - (3.) Crédé's method.

Subsequently to an account of these various methods, which will be given in the order shown, certain experiments bearing on the second group will be detailed.

I.—(1.) LANDERER'S METHOD.

Previously to the year 1892, Landerer had been engaged in investigations on the effect of balsam of Peru in pulmonary

* For the experiments alluded to *vide* E. Semmer, Arch. f. path. Anat. Berlin, 1870, 1. 158. Grohe, Allg. Med. Centralz., Berlin, 1870, 39, p. 333. Nichols, Boston Med. and Surg. Journ., vi., 20.

tuberculosis, and in that year he prepared an emulsion of cinnamic acid, the active principle of the balsam, which he proceeded to inject intravenously. The result of this treatment was shown by Richter and Spiro in a series of communications to be a large increase (90 per cent.) in the polynuclear and eosinophile leucocytes. This leucocytosis begins about an hour after the injection and attains its maximum in four to six hours, the red corpuscles remaining unaffected. Although Landerer and others found the clinical results of this treatment encouraging, the substance was in 1893 discarded by its introducer owing to its insolubility and to the fact that it could not be sterilized, and sodium cinnamate or "hetol" was substituted for it. This drug is easily soluble in hot water and can be sterilized. In 1897 Jurjew experimented with hetol on tuberculous animals, and reported that its action was to produce a general leucocytosis with a local collection of leucocytes round the tuberculous foci, which subsequently resulted in organization and encapsulation. He even went so far as to state that it was possible with absolute certainty to determine whether a tuberculous animal had been treated with hetol or not by a microscopical examination of sections of the affected tissues. This was also the experience of Kanzel; Hansemann, too, considered the appearances seen in the lungs of rabbits which had been treated were quite characteristic. Cordes¹⁵ moreover found similar appearances in specimens obtained by curetting from cases of tuberculous laryngitis to which Landerer's method had been applied. Shaw, in 1902, also established the leucocytosis resulting from hetol injections, making careful differential counts of the leucocytes. Krompecher, however, in 1900, though finding temporary leucocytosis with hyperæmia of bone marrow and increase in the stroma of the lungs (which he attributed to mechanical irritation), stated that two and a half months' treatment by Landerer's method failed to protect rabbits from tuberculosis, and that five guinea-pigs and five rabbits inoculated with tubercle and subsequently treated with full doses of hetol, died as soon as the control animals. Fraenkel also obtained negative results with tuberculous rabbits, while in 1901 Wolff found that hetol injec-

tions extending over one month failed to prevent the breaking down of tubercle artificially inoculated into the anterior chamber of a rabbit's eye. Rabbits infected by inhalation and intraperitoneally inoculated were also uninfluenced by the treatment. In the treatment of phthisis, Landerer insists that the *intravenous* injection of hetol is an essential, as thereby the drug is brought in the most direct manner possible to the seat of the disease; but in children and anæmic persons in whom the veins are not sufficiently prominent, some effect can be produced by the hypodermic way. The dose begins with .5 mgm. of hetol and is gradually increased to 8 mgms.; 15 mgms. is the maximum, and should not be exceeded. The injections take place two or three times a week, and the salt should be freshly dissolved and sterilized before use by five minutes' boiling in water. Contra-indications for the treatment are found in nephritis and diabetes.

Landerer¹⁷ has reported six autopsies on the human subject in which the local effects of hetol could be seen. They resembled those described by Jurjew in rabbits, except that in some cases tuberculous cavities even had become cicatrized. Ewald¹⁸, in a case in which seventy hetol injections had been given, the cause of death being fatty degeneration of the heart, reported that the lungs showed fibrous nodules surrounding small cavities, but no recent tubercles. In another case, however, in which the patient died during the course of the treatment, the tuberculous process was found still active. Tobias, also, failed in nine cases to find any distinctive changes, *post-mortem*, which could be ascribed to the treatment. Landerer's cases¹⁷ between 1896 and 1899 were 36 in number, and included 20 cures; among these one had signs of cavitation and one pneumothorax. Hessen, who reports 27 cases, 18 of which improved, says that his patients continued living amid their usual surroundings—often of an insanitary description—and that no adjuvant treatment was carried out. Weissmann considers that in mild cases without fever or signs of cavitation, 100 per cent. of cures can be obtained with an average of three months' treatment; but Ewald¹⁸ says that the advocates of the method have understated, according to his experience, the time required. Ewald and Marder (who treated 50 cases without

good results) report various unpleasant after-effects. Landerer's explanation of these is that in Ewald's cases the syringe was kept in carbolic acid, some of which may have been injected and produced stupor, and that in Marder's cases a too strongly alkaline solution of the drug was used. The bad results reported by Pirl, Fraenkel, Kuhn, Gidionson, and others, are attributed by Kantrowicz to the initial severity of the disease, and in some cases to overdosage, some injections having been started at 10 mgms. Staub, who failed to observe leucocytosis and regarded hetol as an inert substance, certainly has the majority of observers against him; moreover, his technical methods are open to question.

It is remarkable that Krociewicz, who had good results in a series of cases treated by hetol, failed to note any beneficial effects from the combination of organic arsenic with the injections; especially in view of the fact that Mendel, working with intravenous injections of sodium cacodylate, could detect no advantage in the addition of hetol to the treatment.

The results obtained by various observers are given in Table I., and show that out of a total of 903 patients about 59 per cent. were cured or improved while 41 per cent. were unaffected or died. Pollack states that Allard's figures for ordinary sanatorium treatment, from 1893 to 1900 inclusive, showed that 78.6 per cent. of the patients improved.

The discrepancies in the experimental evidence may perhaps be accounted for by the variations in virulence of the organisms used for inoculating the animals. In Hessen's cases alone is it distinctly stated that hetol was absolutely the only treatment, and some of the good results obtained by others must doubtless be ascribed to a careful sanatorium regimen. On all hands it is admitted that the treatment is useless in advanced and virulent cases, and has no effect on mixed infections. The great interest in the whole method lies in its basis on careful physiological experiment, and in so far it certainly merits success even if it does not attain it. The reaction has been described as an aseptic inflammation, and has been frequently compared to that of Koch's original tuberculin treatment. Possibly the failure of

this method to realize the hopes in which it was inaugurated has, as Kobert said, caused the hetol treatment of tuberculosis to be regarded in a spirit of "listless agnosticism." At present, however, neither the experimental nor the clinical evidence in its favour can be considered as quite unimpeachable.

I.—(2). GAUTIER'S METHOD.

Huxheimer as early as 1897 had injected ·001 to ·005 gm. of arsenious acid into the circulation of patients suffering from psoriasis, but although among 25 patients so treated, 10 were cured and 6 improved, thrombosis, pyrexia, diarrhœa and other unfortunate results occurred, and the treatment seems to have been abandoned. R. Bunsen, in 1841, had pointed out the relatively non-toxic nature of cacodylic acid, ·35 gm. produced no toxic symptoms when injected into the marginal vein of a rabbit's ear, and later on Rabuteau¹⁹ found that 2 gms. were necessary to kill a medium-sized bitch. Widal, in 1900, showed that the administration of sodium cacodylate increased the number of the red blood corpuscles, and in 1901 Chiappori and Pisani confirmed his results. These observers state that the increase attains its maximum in three to four hours, and is accompanied by a relative decrease in the number of leucocytes. The reaction is said to be most marked in cases where a deficiency in the red blood corpuscles exists. It is always followed by an increased elimination of urobilin, and unless iron is administered at the same time no proportionate increase in the amount of hæmoglobin in the blood takes place.

Gautier introduced the injection of cacodylate of sodium in 1899, the advantage claimed for this method being the non-production of cacodyl or its oxide, which always occurs when the drug is given by the mouth. According to Chiappori the arsenic accumulates in the system, being principally eliminated in the urine; traces are also found in the saliva, milk, and sweat, while if large doses are given, some is excreted by the rectum. Fraser, on the other hand, failed to get Marsh's test in urine unless strong acids were added, though in a specimen to which liquor arsenicalis had been added the reaction could always be obtained.

He therefore concluded that the arsenic in cacodylic acid was too firmly combined to be of much use as a therapeutic agent.*

As regards technique, .025 gm. may be given intravenously and increased to .1 gm. The injections are given once or twice a week, one week's treatment alternating with one week's rest. The administration is contra-indicated in all diseases of the liver and in pelvic disorders accompanied by menorrhagia, and is discontinued during the catamenia. The number of cases reported as having been treated intravenously is small. Letulle tried it in three cases of phthisis, in all of which improvement occurred, though the sputum still contained bacilli. Anelli gave it in an advanced case in which great improvement occurred, and Evoli spoke favourably of the method at the Italian Congress of Internal Medicine in 1901. Mendel treated ten cases of tuberculous disease which all improved, especially a surgical case in which some very resistant sinuses healed rapidly. Widal and Merklen tried it in two cases of phthisis without success. Mendel and Chiappori also report eight cases of chlorosis in which satisfactory results occurred, and the method has also been applied occasionally to various other diseases in which arsenic is usually given.

The intravenous method in this treatment is interesting, but evidently not an essential point; Mendel considers it the most certain and rapid method of bringing a patient under the influence of arsenic, while Langlois found that cacodylate of soda was tolerated more easily by rabbits intravenously than when given by subcutaneous injection.

II.—(1). BACELLI'S METHOD.

At the International Congress of Medicine, held in Berlin in 1890, Bacelli reported thirty cases of severe malaria which had recovered under intravenous injections of quinine, whereas in sixteen cases in which the drug was given hypodermically, five deaths occurred. No details are given, but Serafini, whose work

* Fraser experimented with (1) urine of patients to whom sodium cacodylate had been given; and (2) urine to which that substance had been added artificially. His results were the same in both cases.

will be referred to later, states that he saw one case recover in which the prognosis before treatment seemed absolutely hopeless. Bacelli, encouraged by his results, decided to extend the method, and proceeded to experiment on animals with perchloride of mercury. He found that dogs of 8 to 10 kilograms in weight would take .05 gm. HgCl_2 with only slight salivation. Both these substances had been injected into animals experimentally at an earlier date, and quinine had been used intravenously as an antipyretic in man, but neither drug had as yet been applied by this method to the diseases in which Bacelli tried them. His next step, in 1893, was to formulate the following solution :—

HgCl_2	...	gram.	1
NaCl	...	"	3
H_2O	to	"	1,000

of which he injected 1 gm. (=1 mgm. HgCl_2) in cases of syphilis gradually increasing the dose to 4 or even 8 mgms. For doses above 4 mgms. of the salt he subsequently used a 2 per thousand solution. Bacelli's first three cases were (1) a case of cerebral syphilis which for twelve months previously had been vigorously treated without result. In three months, after 61 mgms. HgCl_2 , the paralysis and mental symptoms had disappeared; (2) a case of ulcerated gumma of the tongue which was cured after 120 mgms. HgCl_2 had been given; (3) a case suffering from bronchial stenosis and catarrh with emphysema, and diagnosed as syphilitic. The asthmatic attacks became less severe after six injections. Jemma, Marigliano's assistant at Genoa, soon afterwards reported four cases, two of them cerebral, which improved considerably under treatment by Bacelli's method, though six cases of enteric and one of acute rheumatism, one of erysipelas and one of tuberculosis were treated without marked results. Colombini, as the result of observations on eighteen cases, reported that it was a safe and easy way of giving mercury, but not so rapid as hypodermic injection owing to the smallness of the dosage and the ease with which the drug was eliminated. He moreover observed two cases of transient albuminuria. Campana tried it and was favourably impressed. He seems to consider the action directly

bactericidal. In 1894 Bacelli mentioned his treatment in flattering terms at the International Medical Congress in Rome. In a short paper on Malaria he said that cases treated by intravenous injections of quinine had a mortality of 0 per cent., while of those treated hypodermically 17 per cent. died, a lower mortality than that given at Berlin. In a second paper on the intravenous injection of HgCl_2 he claimed as the special advantages of the method (1) the smallness of the dose; (2) the rapidity of the action; and (3) the direct and prompt application of the drug to the walls of the blood-vessels, which he considered likely to act powerfully on syphilitic endarteritis. He apparently considered the action of the drug to be a neutralization of toxins. In 1894, also, Dagnino published a case of syphilitic iritis in which, other treatment having proved useless, he tried intravenous injections and noted considerable improvement in eight days, a complete cure eventually resulting. During the same year opinions from various other countries were reported. Uhma, in Warsaw, repeated Bacelli's precautionary experiments on animals, and in addition gave himself an injection before trying it on his patients. As the result of observations on six cases he concluded that the method had no special advantages, and that, seeing that in one instance thrombosis had occurred, he could not consider it absolutely without danger. Blaschko used a 3 per thousand and later a 6 per thousand solution, giving a total of 1.5 to 2 cgms. He drew attention to the rapid elimination of mercury, which may be detected in the urine one hour after injection, but has entirely disappeared by the next day unless the injections have been continuous and frequent. He gives no account of his early cases, but sums up rather in favour of the method. In 1895, Lichtenstein reported one case successfully treated with a 3 per thousand solution, a total of 1.2 gm. HgCl_2 having been administered. Görl treated nine cases, five or six injections being given, each with an interval of forty-eight hours between the injections. He considers the treatment easy and safe; a maximum rapidity of action being secured with a minimum quantity of the drug. Some cases, however, owing to fatness of the arm, etc., are unsuited to the method; he notes that the symptoms

rapidly reappear as soon as the injections are discontinued. Dinkler, reporting on nine cases, comes to much the same conclusion as Görl, adding that local thrombosis without constitutional symptoms is common both in man and in experimental animals. Küssel used solutions of 1 to 3 per thousand of the cyanide of mercury, giving doses of 1 c.c. His results were good, though one case of stomatitis occurred. Abadie, with a 1 per thousand solution of the same drug, reported two successful cases. Allgeyer and Sprecher, at Turin, had a case in which .05 gm. HgCl_2 produced severe toxic symptoms with high fever, albuminuria, diarrhoea and collapse. After a week's illness the patient recovered.

At the International Congress of Dermatology and Syphilis, held in London in 1896, Mr. Ernest Lane reported on seventy-six cases which he had treated with injections of 1 per cent. cyanide of mercury during the antecedent nine months at the Lock Hospital in London. The number of injections given to each patient varied from four to forty-six, and the dose at first was 4 minims, later 20 minims. Fifty patients left the hospital free from symptoms of the disease, sixteen improved under treatment, and in six, although improvement occurred, technical difficulties prevented the continuance of the treatment. Four patients refused to allow the injections to be carried out. A few cases had slight adverse symptoms, such as stomatitis and albuminuria, while two cases of abscess, owing to damage of the vein, and one case of somewhat severe ulceration at the site of injection (dorsum of the foot) were also reported. In the discussion which followed, Blaschko stated that after ten to twelve injections thrombosis generally occurred, and after two years' experience he thought that no special advantages could be claimed for the treatment. Justus, of Budapest, after treating seventy patients during the last two years, was not encouraged to continue the treatment, in which opinion he was supported by Ravogli. Jullien, however, considered it useful in cases of long standing, and quoted a patient with a very old corneal opacity which had been cured by Abadie by intravenous injections after other treatment had failed. In the same year Tommasoli, at Palermo,

reported on ten cases of primary syphilis: seven showed no secondary symptoms; two, in which the treatment was begun rather late, had an erythematous rash; and a third, after twenty days of injections, developed a doubtful rash. Fraenkel also in this year exhibited at Hamburg a specimen showing thrombosis of the vein in a patient who had received only two injections of perchloride of mercury. In 1897, Soffiantini alluded to Bacelli's treatment at the International Congress of Dermatology and Syphilis at Moscow. He stated that it had been abandoned by most of those who had given it a trial owing to the rapid elimination of mercury which prevented a proper saturation of the system by the drug. In 1899, Lane published a full synopsis of eighty-four cases in only one of which had the treatment failed to give satisfactory results. In 1902, Parisotti reported a severe case of interstitial keratitis which rapidly yielded to intravenous injections of HgCl_2 , though vigorous anti-syphilitic treatment by other methods had failed to arrest the progress of the disease.

The general opinion of Bacelli's method in syphilis seems to be that in certain resistant cases it is worth trying, as also in cases where it is important to bring the patient very rapidly under the influence of the drug. That it presents any advantages as a routine method, even in hospital practice, is, to say the least of it, open to a considerable amount of doubt.

Bacelli, however, did not content himself with the application of his method to syphilis alone; in 1901, in a Latin address to Virchow, he states that the intravenous injection of perchloride of mercury had been observed to benefit cases of epidemic cerebro-spinal meningitis, influenza in which the central nervous system had been affected, and aphtha epizootica in cattle. Others had also extended the treatment. Jemma's cases have been mentioned, and besides these, Lusignoli, in 1893, applied it to five cases of rheumatic fever, all of which were benefited, and Kesmarsky treated two cases of puerperal septicæmia of a severe type with success. His patients were both first seen on the sixteenth day after delivery; .001 gm. HgCl_2 was administered, whereupon the temperature began to fall. One case received eight and the other six injections, the dose being gradually increased to

·005 gm. Bursi reported two similar cases, but here the injections were intramuscular. Glaesser saw one case of puerperal septicæmia, however, which was uninfluenced by 1 cgm. doses intravenously; 27 mgms. were given altogether to this patient.

The treatment of aphtha epizootica was inaugurated on an extensive scale in Italy when Bacelli was Minister of Agriculture. In 1901 he announced to the Congress of Internal Medicine at Rome that fifty-two cases had been treated at Civita Vecchia and twenty-six in Sardinia, and that in all a rapid and complete cure had resulted.

Buonsanti, in the same year, applied the method with success; out of 177 animals treated by him in Bavaria, only seven died, the temperature falling after the first injection; ·05 gm. was given to cows and ·15 gm. to bulls.

In the Grand Duchy of Hesse,²⁰ however, a virulent epidemic occurred in 1901, which was quite uninfluenced by Bacelli's treatment. 147 cattle belonging to different owners were treated, and 20 (=13·6 per cent.) died: 96 on the same farms were untreated, with a mortality of 13·5 per cent. Among 656 on other farms in the same district, the mortality among uninjected animals was also 13·5 per cent. Among 89 animals in which the treatment was begun before the premonitory symptoms had set in, the disease was mild in 57, severe in 32, 9 of the latter dying. Among 58 treated after the onset of symptoms, 11 (18·9 per cent.) died, the remainder having a more or less severe attack. The experiments were then discontinued.

In the same year further experiments were undertaken in Germany. In Loeffler and Uhlenhuth's report to the German ministry two tests are described: (1) eight animals were injected as soon as the temperature began to rise (39·2° C. in the morning) with ·05 gm. HgCl₂, and the injection in some cases was repeated on the next day. The duration of the fever averaged 3·43 days. In twelve control animals which received no injections, the fever averaged 2·75 days. The temperature curve and the general course of the disease appeared uninfluenced; (2) five animals were given ·05 gm. HgCl₂ thrice in nine days, and then exposed to infection. All had a severe attack in from three to ten days

from that date. Bass' experiments in 1901 are also quoted in the report. Four milch cows which were treated with $\cdot 05$ gm. HgCl_2 on two consecutive days, and two which were left untreated, had all of them similar attacks, the milk production not being favourably influenced by the treatment. That the treatment is not absolutely safe was shown by two cases in which $\cdot 05$ gm. HgCl_2 was given several times in the course of about ten days. Severe illness and albuminuria resulted, and *post-mortem* indications of mercurial poisoning were observed. The total amount of the drug which each animal received was $\cdot 2$ gm., whereas, considering their weight, they should, according to Bacelli, have stood doses of $\cdot 1$ and $\cdot 16$ gm. respectively, repeated as often as appeared necessary.

The explanation of these results, so discordant with Bacelli's original observations, lies in the fact that epidemics of *aphtha epizootica* vary greatly in virulence of type; and whereas some are severe, the majority are mild, nearly all cases, at any rate among cattle, recovering, whether treated with intravenous injections or not. In the severe type, this treatment has evidently no effect.

So long as Bacelli confined his method to the treatment of malaria with quinine and syphilis with mercury, it is clear that he was relying on a well-known "specific" action of the drugs concerned. The method was not based on any principle derived from experiments on animals, the only experiments made being designed to show that HgCl_2 could be injected in small doses without doing positive harm. Bacelli's idea that his method would be useful in cerebral syphilis owing to a direct action of the drug on the walls of the blood-vessels is, of course, pure conjecture. In fact, Bacelli only did what the earliest experimenters with infusion had done when, as Purmann says, having satisfied themselves by trial on animals that many drugs could be injected in this manner, they proceeded to treat all the diseases for which such drugs were usually given, merely substituting direct injection into the circulation for the older method of administration by the mouth.

With foot and mouth disease, however, and the other miscellaneous ailments to which the intravenous injection of mercury salts has been applied by Bacelli and his followers, the case is necessarily different. The powerful bactericidal properties of HgCl_2 no doubt suggested the application of the method, under the impression that they might act directly upon the living cause of the disease. The fact, however, that intravenous injections of HgCl_2 can influence syphilis does not justify the assumption that this action is due to its general bactericidal properties. In the first place, there is no reason for regarding syphilis as a septicæmia of the ordinary type, and in the second place, the amount of the drug which it is possible to inject safely, diluted in the whole mass of the blood, forms an exceedingly weak solution for antiseptic purposes. Before, however, the general question as to the possibility of destroying organisms directly in this manner is discussed, an account will be given of the remaining methods included in this group.

II.—(2). MAGUIRE'S AND EWART'S METHODS.

An account of Maguire's experiments may be found in the Harveian lectures for 1900, and in the Transactions of the British Congress on Tuberculosis in 1901. Dr. Maguire began by injecting cyanide of mercury in the manner already described by Mr. Ernest Lane. However, a rabbit to which he gave 5 c.c. of a 2 per cent. solution died before the injection could be completed, and two patients suffering from phthisis to whom 20 minims of the same solution had been given were found soon afterwards to be suffering from collapse and other symptoms attributed by Dr. Maguire to HCN poisoning. The dose was perhaps high, but undoubtedly the physical condition of a patient suffering from acute phthisis is not comparable to that of an otherwise healthy man with primary syphilis. In this incident one of the main difficulties in the application of any antiseptic substance is well illustrated; the toxic effect of the drug can never, unfortunately, be absolutely limited to the organism it is intended to destroy, and the more serious the condition of the patient the more likely are adverse symptoms to occur after the injection of an anti-

septic. Afterwards, taka-diastase and cytase were tried with a view to dissolving the cellulose said to form part of the capsule of the bacillus tuberculosis, and then nucleinate of soda in order to produce local leucocytosis, but none of these substances had any very marked beneficial effect on the patients. The necessity of sterilizing these solutions, however, led to the employment of formaline, and it occurred to Dr. Maguire that possibly this antiseptic might be made to act on the bacillus tuberculosis *in situ*, or, at any rate, on the less resistant staphylococci and diplococci which accompany it. After many experiments on animals and on himself, he found that a solution of formic aldehyd 1 in 200 in normal saline could be given safely to rabbits, and 1 in 500 to man, provided that in the latter case the dose was not more than 50 c.c. In practice he used a 1 in 2,000 solution, injecting 50 c.c. daily into a vein at the elbow by means of a burette, to the upper end of which an india-rubber syringe was attached in case extra pressure should be required. The injection was made at the rate of about 1 c.c. per heart beat, and as the right ventricle of a man weighing $10\frac{1}{2}$ stone is calculated to contain about 100 c.c., with each beat a solution of formic aldehyd 1 in 200,000 was pumped through the lungs for about two-thirds of a minute. The clinical results were encouraging, for though cases of considerable severity were treated, a great deal of improvement took place under very varied environment. Some patients lived in Lambeth at their own homes, some were inmates of the Brompton Hospital, and some private patients living in London. The treatment was tried with equal success at Hendon and Bournemouth. Two hundred cases in all have been reported. The immediate effect was often to cause a slight discomfort to the patient, and the cough was often increased at first owing to the irritating action of the formic aldehyd on the bronchi. Dr. Maguire, when experimenting on himself with a large dose, produced a general catarrh of all the mucous surfaces except that of the stomach. The ultimate result of the treatment was the clearing up of all signs of active disease and the disappearance of tubercle bacilli from the sputum in all cases, unless the disease were particularly active or much

lung tissue had been destroyed. In these latter, though improvement occurred, bacilli were still found in the sputum. Even cases considered desperate, which finally succumbed to the disease, showed some signs of improvement under treatment. Koch states that in German sanatoria only 20 per cent. of the patients leave hospital with no tubercle bacilli in the sputum.

Dr. Ewart's protargol injections are included in this section, as his method is the same as that of Dr. Maguire, with the difference that protargol is substituted for formic aldehyd. 40 c.c. of saline solution containing from $1\frac{1}{2}$ to $2\frac{1}{2}$ grains of protargol were injected, a little more saline being run through the needle before its removal to wash out the last traces of the drug. This would make the strength of protargol in the ventricle .09 to .16 per cent., or about 1 in 1,111 to 1 in 625. The injections were usually made every other day. Remarkable subjective feelings of improvement were noted in all cases; and though a rise of temperature followed immediately on the operation, the general tendency of the treatment was to reduce the pyrexia.

Expectoration and cough also diminished, the former becoming thin and mucous in character, but observations on the contained tubercle bacilli are not recorded. A case in which there was albuminuria, and another with hæmoptysis, were much benefited. No list of cases is given. Dr. Ewart's claim is that it hastens cure, and thus in cases treated in sanatoria diminishes the time necessarily spent there, and markedly reduces the cost of the treatment.

In comparing the two methods, it appears that protargol gives theoretically a stronger antiseptic solution. Formic aldehyd 1 in 100,000 is not a powerful antiseptic, but some accumulation of the drug may occur, rendering the actual strength of the solution greater than the proportion given. The proximity of the pulmonary circulation to the site of injection is, of course, a point in favour of the method.

II.—(3.) CREDE'S METHOD.

In 1901, Credé, of Dresden, read a paper before the Hufe-landschen Gesellschaft of Berlin, in which he detailed certain

experiments in the bactericidal qualities of metals, and gave an account of a new method of treatment founded on the results of his observations. If a piece of metallic silver be placed on a plate cultivation of bacteria, a ring on which no bacteria can be found forms round it, and the metal is gradually decomposed. This reaction takes place in greater or less degree with all metals, silver holding the fourth place in a series which begins with thallium and ends with aluminium, the bactericidal properties of which are practically *nil*. The same reaction, Credé asserted, could be seen on the surfaces of infected wounds, whereas on aseptic granulating surfaces no absorption of metal occurred. Credé next proceeded to inject silver salts into the veins of animals, the substance eventually chosen being the citrate, which, owing to its solubility being only 1 in 4,000 does not easily form an inert albuminate in the blood. Eventually this was superseded by a colloid form of the metal itself (Collargol), which was used in a 1 per cent. or 2 per cent. solution, the injections being repeated once or twice a day. As much as 5 c.c. of the weaker solution has been used at one injection, but no cases of silver poisoning have as yet been observed.

Credé has treated a case of very severe and extensive gangrene following injury, a case of multiple purulent arthritis, a case of acute rheumatism, and two cases of phthisis. The first three of these were cured, and of the last two one improved under treatment. Fischer injected 5 c.c. of collargol into the cephalic vein in a case of malignant pustule situated just below the zygoma. The temperature fell after twenty-four hours, and two further injections were given at intervals of thirty-six hours. The case recovered. C. L. Klotz, in a case diagnosed as septic endocarditis, also tried collargol (1 per cent. solution). 9 cgms. were injected; a rigor and rise of temperature to 103° F. followed. On the next day the injection was repeated with similar results. On the third day the patient seemed no better; 7 cgms. were injected, this time followed by only a slight rise of temperature. Improvement then began; in five days the temperature was normal, and recovery is said to have ensued. The case was only reported in July, 1902; the subsequent history

would be interesting, as testing both the diagnosis and the value of the treatment.

J. Müller injected collargol (1 per cent.) in thirty cases, which included "threatened" erysipelas, epidemic cerebro-spinal meningitis, pneumonia, phlegmonous erysipelas, puerperal perimetritis, pleurisy with effusion, peritonitis, appendicitis and empyema; a sufficiently diversified list. He also reported a case of acute rheumatism which failed to react to fourteen days' treatment with salicylates, but was cured by two injections of collargol, and a case of tuberculous disease of both knee-joints in an emaciated girl, in which after the second injection the temperature fell and the sinuses began to heal. With regard to the last two cases, possibly the fourteen days of salicylates had something to do with the cure in the first; and the emaciation in the second gave an indication for careful feeding and better hygiene, which no doubt was not overlooked by the physician.

Weckelmann treated two cases of septic endocarditis, with good results. He considers that owing to the rapid elimination of the silver, repeated injections are always necessary to success.

The number of cases recorded is too small to admit of any opinion being formed as to the merits of this treatment; it appears, however, to be comparatively harmless to the patient, though a rigor is said to be the usual consequent of each injection. The fact that in many cases the diagnosis cannot have been absolutely established, renders judgment still more difficult. Ten carefully reported cases of phthisis, with accurate bacteriological observations on the sputum, would be more reliable evidence as to the value of collargol than all the thirty cases reported by Müller.

EXPERIMENTS WITH ANTISEPTICS ON ANIMALS.

The question as to whether it is possible to apply antiseptics directly to organisms living in the blood-stream has been investigated by several observers, more especially with reference to perchloride of mercury. The usual procedure has been to inoculate a rabbit with some organism producing a definite septicæmia, and then to inject a solution of the antiseptic hypodermically or intravenously. In some cases protective injections have been given, the virulent organism being subsequently inoculated. It

must be admitted that while a strongly positive result in such experiments would prove a good deal, a negative result cannot be regarded as disposing of the whole question. It is not possible to argue with more than relative certainty from results obtained by observations on one particular disease or animal that similar results will follow with regard to other diseases or animals, even though the diseases in question belong to the same group, *e.g.*, septicæmia. Nevertheless, the accuracy with which laboratory experiments can be carried out gives great weight to the results obtained from them, even when negative, as compared to the results of clinical observations where even the disease for which any given treatment is instituted cannot always be diagnosed with absolute certainty; where no control experiments are, as a rule, possible; and where the method to be tested is seldom the sole means adopted for influencing the diseased condition.

The following substances have been used, in various ways, as direct internal antiseptics :—

- (1) Oxide of silver.
- (2) Creolin.
- (3) Formic aldehyd.
- (4) Sodium sulpho-carbolate.
- (5) Perchloride of mercury.

1. Behring²¹, in 1887, injected oxide of silver dissolved in pentamethylene-diamine hypodermically into animals infected with anthrax; he found that guinea-pigs and rabbits injected with non-toxic doses lived one to three days longer than the controls, while mice survived from twelve to twenty-four hours. With toxic doses animals lived longer than the controls, and bacilli were only rarely found in the blood or organs. One rabbit which survived was calculated to have a solution of 1 in 7,500 of oxide of silver in the blood. Spores outside the body are only killed by 1 in 1,500 after two or three days. Behring thought that minimal doses rather increased the susceptibility of animals to anthrax. A 2 per cent. solution was used.

2. The late Dr. Washbourn, in 1888, tried creolin hypodermically in guinea-pigs and rabbits, and found that while it had no protective action against anthrax, when injected after inoculation,

it appeared to inhibit the growth of the bacillus, though not preventing death. Rabbits seemed particularly susceptible to the toxic properties of the drug.

3. Fischer and Fricker, in 1901, inoculated twenty-four guinea-pigs intraperitoneally with tubercle, and divided them into four groups according to weight. Reserving the heaviest animal in each group as a control, they injected 8 c.c. of a 1 per cent. solution of formic aldehyd into the peritoneum of the remainder every few days. The controls in all cases survived the other animals. Unfortunately no control experiments with formic aldehyd alone were made.

4. Cash, in 1884, endeavoured to protect rabbits from anthrax by hypodermic injections of sulphocarbolate of soda, but with negative results.

5. Following on the last experiments, Cash, by the hypodermic method, succeeded in protecting two rabbits against anthrax by small injections of HgCl_2 carried out continuously for some weeks before inoculation. The drug was given in the proportion of about .0004 gm. per 100 gms. body weight. Another animal which received .0005 gm. per 100 gms. body weight was not protected. Koch, in 1881, and Behring, in 1894, both obtained negative results by this method, the amount of HgCl_2 given, being .0002 gm. per 100 gms. body weight. Cadéac experimenting with dogs found that a dose of .000005 gm. per 100 gms. body weight actually lowered the resistance to anthrax when inoculated half an hour after injection. He also quotes Usac (Thèse de Paris) in support of this observation.

Serafini and Spissu in connection with Bacelli's recent work, carried out some very careful experiments with the intravenous method, published during 1902. Serafini determined the maximum non-lethal dose of HgCl_2 as .5 mgm. in a rabbit weighing 1,800 gms., which is .00027 gm. per 100 gms. body weight. Four rabbits were inoculated with 1 cmm. of an agar cultivation of anthrax; one died in some hours, another shortly after the injection (twenty-four hours later) of 5 mgms. HgCl_2 . The remaining two, one of which had also been injected, died during the next night. Three more rabbits were given a smaller dose of

anthrax, and two were injected with 5 and 2 mgms. of HgCl_2 respectively after an interval of eight and a-half hours. All three died about the same time. A similar experiment in which the injections took place eighteen hours after inoculation gave the same results. In a fourth set an emulsion of a twenty-four hours anthrax cultivation on agar was made and .5 c.c. injected into the jugular vein (= approximately 1,000 bacilli); the result, however, was the same as in the previous cases, though the bacilli appeared more numerous in the blood of the control rabbit. Blood from infected animals (as being more certainly spore-free) was also tried for inoculation purposes; the animals treated died a little sooner than the control. With the vibrio of fowl cholera no more encouraging results were obtained. Three sets of animals were inoculated with a small loopful of a forty-eight hours cultivation of a virulent vibrio, and injected with 5, 2, and 1 mgm. HgCl_2 , some immediately after and others at intervals of six and eight hours. The results were negative, though one animal survived among those injected. All Serafini's results were confirmed by *post-mortem* examinations, cultivations of pure anthrax and fowl cholera respectively being obtained in all cases of death.

Spissu established the maximum non-lethal dose for rabbits as .0003 gm. HgCl_2 intravenously, and .0006 gm. HgCl_2 hypodermically per 100 gms. body weight. He found that one to eight previous injections had no protective action against anthrax, and that serum from animals so treated was likewise inert. He next proceeded to inject rabbits intraperitoneally with anthrax and the solution of HgCl_2 . If the injections were made simultaneously and into the same side of the body, the animals survived; but if the anthrax was injected on one side, and the HgCl_2 on the opposite side, they died. He obtained, however, a positive result from injecting anthrax into one jugular vein, and the solution of perchloride into the other. He next tried inoculating animals with anthrax hypodermically, and injecting HgCl_2 into a vein at varying intervals afterwards. The rabbits in which these injections took place between twenty to thirty hours after inoculation, survived; whilst the rest died. By making a series of cultivations from the blood of infected animals, he found that the bacilli began

to appear in the peripheral circulation about twenty to thirty hours after hypodermic inoculation. On repeating his injection experiments, however, at this interval after inoculation, he failed to keep the animals alive. He then injected a large dose of HgCl_2 into the circulation of an infected animal, and bled it into sterile tubes at intervals ranging from a few minutes to ten hours subsequently. Anthrax colonies appeared in all the tubes, a result he attributes to the formation in the blood of an inert albuminate of mercury. In a similar experiment he injected anthrax into one jugular vein and immediately injected HgCl_2 into the other. The rabbits were killed at intervals varying from a few minutes to three hours later, and cultivations made from the blood, spleen, and other organs. A good growth appeared even when a toxic dose of HgCl_2 had been given.

The absence of control animals and the fact that he was unable to get uniform results, discount the value of Spissu's earlier and more successful experiments.

In connection with the action of HgCl_2 in albuminous substances, Behring²⁸ has shown that though 1 in 10,000 of the salt will inhibit bacillus anthracis in blood serum after an exposure of two days, neither a longer exposure nor a stronger solution have any more powerful action, as the perchloride is decomposed.

The following experiments* were carried out during the summer of 1902 at the Lister Institute of Preventive Medicine. The actual injections were kindly made for me by Dr. Macfadyen. With regard to general technique, it may be said that all intravenous injections were made into the superficial veins of the rabbit's ear; the solutions were all freshly prepared on each occasion, the weighing of the somewhat small quantities of the various salts necessary being accurately carried out on a chemical balance. The dosage, therefore, may be regarded as practically exact. The formic aldehyd solutions were made from Schering's 40 per cent. formalin solution. In determining the percentage of a drug in the blood, the mass of the blood has been taken at one-thirteenth of the body weight, and its specific

* The results of these experiments were published in a communication to the *Lancet*, January 10th, 1903.

gravity at 1050. The resulting figure is, of course, only an approximate maximum, as neither decomposition, elimination or accumulation can be reckoned.

Table II. gives the results of the injection of perchloride of mercury. The object of this and other experiments in the first series was to find out whether by giving small doses spread out over a long period a better antiseptic effect could be obtained, or any tolerance of the drug established. Far from the latter being the case, it appeared that doses of HgCl_2 very much below the maximal dose as determined by Serafini and Spissu had a profound effect on the general nutrition, the animals becoming thin and frequently suffering more or less from diarrhoea. The results, in fact, were so discouraging that it seemed useless to attempt any experiments with inoculated animals. Taking the highest possible non-lethal dose, .0003 gm. per 100 gms., the amount which could be injected into a large rabbit of 2,000 gms. would be .006 gm., and the percentage in the blood would be .0042 or 1 in 24,000 nearly. Behring has shown that 1 in 2,000 HgCl_2 is necessary to kill anthrax in blood serum, and that even to inhibit it a solution of 1 in 10,000 must be allowed two days' continuous action. The latter would mean a dose of .014 gm. for a rabbit weighing 2,000 grms., or more than double the maximum dose. In a man of 70 kilograms, taking the blood at about 5,000 c.c., .5 gm. HgCl_2 would have to be injected to produce such a solution. Bacelli's maximum dose (8 mgms.) only produced a solution of 1 in 635,000.

Further experiments were then made with the following substances:—

- (a) Oxycyanide of mercury.
- (b) Formic aldehyd.
- (c) Chinosol.
- (d) Protargol.
- (e) Sodium taurocholate.

(a) Table III. shows the effects of successive doses of oxycyanide of mercury $\text{HgOHg}(\text{CN})_2$. This substance is said by Chibret to possess six times the bactericidal power of HgCl_2 , and Boer, quoted in Sternberg's Bacteriology, says that two hours' exposure

of bacillus anthracis to a 1 in 40,000 solution of oxycyanide in broth killed; whilst 1 in 80,000 inhibited. De la Croix found that 1 in 25,000 HgCl_2 was necessary to inhibit the growth of anthrax in broth. For the purpose of injection, the oxycyanide has the advantage of not coagulating albumen (Schlösser). It will be seen from rabbit No. 7 that .0002 gm. per 100 gms. produced toxic symptoms, and that between .0004 and .0005 gm. is probably the highest proportion per 100 gms. which can be safely employed. This means a solution of about 1 in 140,000 in the blood, which even theoretically cannot be supposed to exert an inhibitory action in the circulation. Some experiments were, however, made and will be detailed later, with inoculated animals.

(b) Table IV. shows the results of treating seven rabbits with formic aldehyd solutions. Apart from immediate toxic effects such as were seen in Nos. 8 and 10, the stronger solutions were apt to produce local thrombosis with oedema and subsequent gangrene of the ear. In many cases an irritating action was observed on the mucous membrane of the nasal passages, the animal sitting up and rubbing its nose with the fore-paws immediately after the injection, while in one case a mucous discharge from the nostrils occurred. Loss of weight occurred even after the weaker injections, when prolonged for more than a few days. Pottevin found that .038 gm. formic aldehyd per kilogram had no ill-effect when injected intravenously in rabbits, but Aronson and Trillat found that .03 gm. per kilogram was fatal in a short time, coagulation of the blood being found *post-mortem*. A 2 per cent. solution was used. They succeeded in giving a rabbit weighing 1,900 grams 2 c.c. of this solution daily for four days. They also note that it is apt to damage the walls of the blood-vessels if used in strong solutions. With regard to the antiseptic power of formic aldehyd, 1 in 50,000 is stated by Flugge to show a noticeable inhibitory action in broth; Blum noticed only a scanty growth of bacillus anthracis on the sixth day with a solution of 1 in 20,000 in culture media. Slater and Rideal found that 1 in 10,000 killed anthrax bacilli in thirty minutes. Doses of .0005 to .001 gm. per 100 gms. would give a

solution in the blood of rabbits of 1 in 14,000 to 1 in 7,000, which may be regarded as a solution of some antiseptic power.

(c) Chinosol (quinoline potassium sulphate, $C_9H_6NKSO_4$) was injected into four rabbits, as shown in Table V. Doses of more than .002 gm. per 100 gms. in all but one rabbit produced symptoms of intoxication which, however, were only transitory. Doses as small as .00042 to .0005 gm. per 100 gms. when repeated at intervals of about forty-eight hours produced gradual but steady loss of weight, but may be regarded as a safe dose for short periods. This would amount to a solution of about 1 in 14,000 in the blood. Beddies and Fischer found that 1 in 8,000 chinosol killed anthrax bacilli in nutrient media in three hours, while Benecke found that 1 in 20,000, acting for twenty-four hours, was an antiseptic though not a bactericidal solution. Hobday found that its toxic properties when injected subcutaneously varied considerably in different animals; for cats, which are very susceptible animals, one-sixteenth grain to every pound body weight being the dose, or about .001 gm. per 100.

Two rabbits were also injected with a mixture of chinosol and formalin (Table VI.), but this seemed to have a peculiarly toxic effect. Even doses of .00027 gm. of each per 100 gms. caused the rabbit to lose weight, and look generally very ill and out of condition. This would only amount to a solution of 1 in 30,000 of each drug in the blood, but any antiseptic advantage gained seemed so considerably overbalanced by the heightened toxicity that no further experiments were carried out.

(d) Table VII. shows the effects on rabbits of protargol, an albuminous compound containing 8 per cent. of silver. The susceptibility to this drug varied somewhat in different cases. Rabbit No. 22 stood .0013 to .002 gm. per 100 gms. daily for some days, though an occasional paralysis was observed. In No. 24, however, .003 to .0005 gm. per 100 gms. at intervals of several days resulted in a steady loss of weight. The lower of these doses was adopted as the maximum safe dose for continued injections. This would mean a solution in the blood equal to about 1 in 25,000. Benario states that 1 in 10,000 had

no inhibitory effect on bacteria, but inoculation experiments were performed in order to add completeness to the observations.

(e) Although there seems considerable doubt as to the potency of bile as a bactericide or antiseptic, the bile acids and their salts are generally regarded as antagonistic to the growth of bacteria. Copeman and Winslow found that bile itself had little antiseptic power *in vitro*, and though Neufeldt was able to kill pneumococcus cultures by planting them in test-tubes containing .1 c.c. rabbit's bile in 2 c.c. broth, he found cultures of anthrax and other bacteria quite uninfluenced. Vallée found that rabbit's bile destroyed the virus of rabies, and Charrin and Roger found the antiseptic action of bile salts, and especially of the taurocholate of soda, far greater than that of bile itself. A 10 per cent. solution of this salt in broth killed various species of bacteria. Bouchard and Tapret, quoted in Richat's Dictionary of Physiology, state that .46 gm. per kilogram is the lethal dose of taurocholate of soda intravenously, this salt being slightly less toxic than the glycocholate.

The experiments on rabbit No. 25 (Table VIII.) showed that a much smaller dose, repeated at intervals of a few days, caused considerable loss of weight; about .00005 gm. per 100 gms. being as much as could be given without seriously depressing the animal. This only amounts to a .0007 per cent. solution in the blood.

A second series of experiments was undertaken to test the effect of the substances above enumerated on rabbits infected with anthrax. The results are shewn in Tables IX., X., and XI. The general arrangement of the experiments was as follows :—

The blood of a guinea-pig which had recently died of the disease was planted on an agar tube and incubated for twenty-four hours at 37° C. The cultivation was then examined microscopically and found to be pure. A small platinum loop, the capacity of which had been previously ascertained to be .3 mgm., was then filled and the growth transferred to 10 c.c. broth and incubated for sixteen hours at 37° C. Cover-glass preparations shewed that this growth was free from spores. It was then diluted with an equal quantity

of sterile broth and well shaken up; .5 c.c. was injected intraperitoneally into six rabbits. The first injection of each drug was made into the marginal vein of the ear immediately after inoculation, and the subsequent injections were made at about twenty-four hours interval. The control rabbit, and those treated with protargol and sodium taurocholate survived; those treated with oxycyanide of mercury, formic aldehyd, and chinisol, died. In these and in all other animals which died, the thorax and abdomen were opened under full aseptic precautions and coverslip preparations were made of two specimens of blood from the left ventricle and two of blood from the spleen. At the same time four agar tubes were also inoculated from the same sources. The results were positive in all cases.

The blood of the various animals was also examined during life for anthrax, but with negative results.

The three animals which survived were again inoculated eight days after the first experiment was begun (Table X). The anthrax was prepared in the same manner, but the broth cultivations not being diluted at all, a dose double the size of that previously administered was given. The rabbit treated with sodium taurocholate died first, then the control, and lastly the one treated with protargol. The *post-mortem* results were positive.

The conclusions drawn from these experiments were that the anthrax not being highly virulent, the small dose administered to the first set was not necessarily fatal; that the sodium taurocholate and protargol practically acted as inert substances, but that the oxycyanide of mercury, formic aldehyd and chinisol sufficiently lowered the resistance of the animals to allow even the small dose of anthrax to prove fatal.

To confirm these experiments another series of rabbits was inoculated with .5 c.c. of an undiluted (10 c.c.) broth cultivation of anthrax prepared as above described. Five rabbits were intravenously injected as before.

The results are shown in Table XI. The oxycyanide of mercury rabbit and the sodium taurocholate rabbit died in two and a half days, the protargol rabbit in three days, and formic

aldehyd rabbit and the control in three and a half days, while the chinosol rabbit lived four days. The *post-mortem* results were all positive.

The order of death did not appear to warrant any deductions as to the relative toxicity of the various drugs; in this series the chinosol rabbit alone survived the control. If anything the oxycyanide of mercury might be considered slightly more toxic than the rest, as in each case the animal to which it was administered died before the others. All the animals remained in good condition until shortly before death, which in some cases occurred quite suddenly.

As in the case of chinosol and formic aldehyd it appeared possible to inject enough of the drug to produce a solution which outside the body would have an antiseptic action, another set of rabbits was treated with these substances. The strength and frequency of the injections was also increased, and the diplococcus pneumoniae substituted for the bacillus anthracis as being a less resistant organism. The diplococcus from a virulent strain was grown on standardized agar tubes smeared with fresh rabbit's blood after the method advised by Dr. J. W. H. Eyre and the late Dr. Washbourn. A loopful of the cultivation (3 mgm.) was diluted 100,000 times with sterile broth, so that 1 c.c. of the emulsion contained .00001 loopful of the diplococcus. The inoculation was made subcutaneously, and in rabbits 38 and 39 an intravenous injection was given of formic aldehyd and chinosol respectively immediately after inoculation. These were repeated at three-hourly intervals in the first day, and at four-hourly intervals on the succeeding days. Paralysis was well marked after each injection of chinosol. Rabbit 39 died in two and three-quarter days, a few hours after the last injection. Rabbit 38 had no injection on the fourth day as the ears were too oedematous, and died during the following night. The control lived five and a half days.

Post-mortem the blood of the left ventricle in rabbits 38 and 39 showed pneumococci when examined microscopically, and a good growth on blood agar was obtained after forty-eight hours' incubation at 37° C. In the control the pneumococci

could not be demonstrated in cover-glass preparations, but the growth on blood agar was obtained in forty-eight hours, as in the other cases.

CONCLUSIONS.

From these experiments the following conclusions may be drawn :—

(1) That it is possible to inject small quantities of oxycyanide of mercury, formic aldehyd, chinisol, protargol and sodium taurocholate into the circulation of rabbits, but that if the injections are prolonged over several weeks the animals lose weight, no tolerance of any of these drugs being established.

(2) That of these drugs formic aldehyd and chinisol can be injected in sufficient doses to make a solution in the mass of the blood which outside the body would have some antiseptic effect.

(3) That rabbits inoculated with anthrax and then injected with small doses of the above substances, die, as a rule, rather sooner than untreated control animals; oxycyanide of mercury being, if anything, the most toxic drug.

(4) That if chinisol and formic aldehyd are given in comparatively large doses, the depressing effects of the drugs are more markedly seen.

Reviewing the subject of the intravenous injection of drugs as a whole, it will be seen that during the past 250 years the various attempts which have been made to introduce the practice generally have, after more or less extended trials, been invariably abandoned. Recent attempts, though scientifically far more justifiable than those which preceded them, cannot be said to have met with a much greater measure of success; and although modern methods have undoubtedly reduced the inherent dangers of the practice, modern knowledge has also shown that they are far more formidable than the earlier experimenters imagined. With regard to the direct injection of antiseptics, the clinical evidence, open as it is to so many inevitable fallacies, gives at best only a very qualified support to the idea that such a proceeding can influence favourably the course of a bacterial disease; whilst the experimental evidence, considered as a whole, has hitherto been distinctly against it. The discovery of a drug of

such selective capacity that, while injuring fatally the cells of living bacteria, it would leave the cells of the host entirely uninfluenced, seems at present a remote contingency; and until unquestionable experimental evidence of the existence of such a substance is forthcoming, it would seem more rational to abandon further clinical trials, and thus to close another chapter in the history of the somewhat ill-fated "*Chirurgia Infusoria*."

POSTSCRIPT.—Since the above Thesis was completed, at the end of 1902, several communications have appeared, a few of which, perhaps, I may be allowed to mention. Dr. W. V. Shaw (*Journ. of Hygiene*, April, 1903) has described some interesting experiments on the injection of formalin, guaiacol and chinosol in rabbits, which, though planned on rather different lines to my own, support the same conclusions. Dr. H. Batty Shaw has carried out further experiments showing the *relative* polynuclear leucocytosis produced by hetol (*B. M. J.*, 1902, ii., p. 1903). Dr. T. W. Dewar has published a preliminary report on the treatment of phthisis by intravenous injections of iodoform dissolved in ether. He considers that solid particles of iodoform are deposited in the lungs owing to the evaporation of the ether, and claims good results in practice. Further observations and experiments are, however, to be desired (*B. M. J.*, 1903, ii., p. 1328). Trommsdorff (*Münch. Med. Woch.*, 1902, p. 1300) has published an account of some experiments on animals with Credé's collargol, the results of which were uniformly unfavourable; an account of these, with a review of the clinical evidence, and some test-tube experiments on the antiseptic value of collargol will be found in the *Bristol Medico-Chirurgical Journal* for December, 1903. Dr. Ewart (*Lancet*, January 17th, 1903) suggests that the clinical successes obtained by collargol and protargol may be due to some other action than antiseptics; for the former drug a catalytic process has been invoked, but this does not explain the discrepancies between the clinical and experimental evidence. Finally, Dr. W. E. Dixon's paper on Hypodermic Purgatives (*B. M. J.*, 1902, ii., p. 1244) suggests to my mind the possibility of a revival of one of the older applications of intravenous medication.

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TABLE I.

NAME.	Cases.	Cured.	Im- proved.	Un- affected	Died.	REMARKS.
Azmanova ...	15	2	4	4	5	Subcutaneous. In only 3 out of 14 did improvement appear due to Hetol. Many were in- jected subcutaneously.
Bernheim ...	11	—	11	—	—	
Ewald ...	25	—	14	4	7	
Exchaquet ...	30	—	20	10	—	Those which failed to im- prove were all severe cases.
Fraenkel ...	22	—	5	17	—	
Franck ...	13	—	8	5	—	
Frieser	30	9	11	10	—	4 out of the 7 got worse. 12 cases were treated in same way without Hetol. 7 were much improved, 4 moderately so, and 1 got worse.
Gidionsen ...	15	—	8	7	—	
Gortsharenko	11	—	11	—	—	In 9 the improvement was slight. 4 cases cured were very slight. Surgical cases. 32 improved markedly. Very bad cases not in- cluded. No leucocytosis observed. 6 of the 15 unaffected got worse.
Guttmann ...	102	22	21	59	—	
Hessen ...	27	—	18	9	—	
Hödlmoser ...	18	—	4	14	—	
Humbert ...	28	10	11	5	2	
Krause ...	30	3	10	9	8	
Kantrowicz ...	34	21	10	3	—	
Krokiewicz ..	43	1	20	22	—	
Landerer ...	156	88	34	34	—	
Lewksi ...	8	—	7	1	—	
Mann ...	14	6	5	2	1	No leucocytosis observed. 6 of the 15 unaffected got worse.
Nihues ...	62	26	15	12	9	
Pollak ...	48	—	42	5	1	
Schottin ...	25	6	4	4	11	No leucocytosis observed. 6 of the 15 unaffected got worse.
Staub ...	20	—	—	20	—	
Tobias ...	45	—	21	15	9	
Weissmann ...	27	21	2	—	4	No leucocytosis observed. 6 of the 15 unaffected got worse.
White ...	2	—	—	2	—	
Wolff ...	42	—	—	42	—	
Total ...	903	215	306	315	57	

Equals (about) $\frac{24+35}{59}$ per cent. $\frac{35+6}{41}$ per cent.

59 per cent. 41 per cent.

TABLE II.—PERCHLORIDE OF MERCURY.

RABBIT No. 1.

Date.	Weight in gms.	Dose cc.	Dilution.	Gms. HgCl ₂ .	Gms. HgCl ₂ per 100 gms.	Percent- age in blood.	Remarks.
M. 6	1490	·5	1 in 2,000	·00025	·000016	·0002	
8	1520	·75	"	·00037	·000025	·0003	
9	1520	{ ·5 } { ·5 }	"	·0005	·000033	·00045	
10	1460	1	"	·0005	·000034	·0005	
12	1460	1	"	·0005	·000034	·0005	
13	1440	2	1 in 1,000	·002	·00014	·002	
14	1460	2	1 in 500	·004	·00028	·004	
15	1350	No	further injections.				Rabbit rapidly lost weight. Diarrhoea— death.
21	1160						

RABBIT No. 2.

M. 26	2150	2	1 in 1,000	·002	·00009	·0012	
J. 3	2190	3	"	·003	·00013	·0019	
4	2190	3	"	·003	·00013	·0019	
5	2190	3	"	·003	·00013	·0019	
6	2180	No	further injections.				Weight fell for 5 days then rose again till date given.
16	2340						

RABBIT No. 3.

J. 9	2100	·3	1 in 1,000	·003	·00014	·002	
10	2120	{ 3 } { 3 } { 3 }	"	·006	·00028	·004	
11	2040	{ 3 } { 3 }	"	·006	·0003	·00402	Ears very œde- matous.
13	1910	No	further injections.				Lost weight and died next day.

TABLE II.—continued.

RABBIT No. 4.

Date.	Weight in gms.	Dose cc.	Dilution.	Gms. HgCl ₂ .	Gms. HgCl ₂ per 100 gms.	Percent- age in blood.	Remarks.
J. 25	1830	1·5	1 in 1,000	·0015	·00008	·0011	Steadily lost weight till July 25.
26	1780	—	—	—	—	—	
27	1800	1	"	·001	·000055	·0007	
30	1790	—	—	—	—	—	
Jy. 1	1720	1	"	·001	·00006	·0008	
2	1690	—	—	—	—	—	
3	1730	·5	"	·0005	·00003	·0004	
4	1750	—	—	—	—	—	
5	1730	·5	"	·0005	·00003	·0004	
7	1780	1	"	·001	·00005	·0007	
8	1770	—	—	—	—	—	
9	1700	1·5	"	·0015	·0009	·0012	
10	1640	—	—	—	—	—	

RABBIT No. 5.

Jy. 15	2640	1	1 in 2,000	·0005	·000018	·0002	
16	2600	—	—	—	—	—	
17	2540	·5	"	·00025	·000009	·0001	
18	2500	—	—	—	—	—	
19	2450	—	—	—	—	—	
21	2480	·5	"	·00025	·00001	·00013	
22	2450	—	—	—	—	—	
23	2450	—	—	—	—	—	
24	2430	—	—	—	—	—	
25	2400	—	—	—	—	—	
29	2430	—	—	—	—	—	
30	2390	—	—	—	—	—	
A. 1	2380	—	—	—	—	—	
6	2310	·5	"	·00025	·00001	·00015	
11	2300	—	—	—	—	—	
12	2350	—	—	—	—	—	
14	2340	1	"	·0005	·00002	·00029	

TABLE III.—OXY-CYANIDE OF MERCURY.

RABBIT No. 6.

Date.	Weight in gms.	Dose, cc.	Dilution.	Gms. Hg ₂ O Cy ₂	Gms. Hg ₂ O Cy ₂ per 100 gms.	Percent- age in blood.	Remarks.
M. 27	2170	·5	1 in 1000	·0005	·000023	·00031	Convulsions for a few minutes after injection. Continued to lose weight till J. 11.
28	2140	1	"	·001	·000047	·00062	
29	2150	2	"	·002	·000094	·00124	
30	2150	—	—	—	—	—	
J. 3	2170	2	1 in 750	·003	·000141	·00186	
4	2230	2	1 in 500	·004	·00018	·00254	
5	2050	·2	1 in 300	·006	·00032	·004	
6	1860	—	—	—	—	—	

RABBIT No. 7.

Jy. 9	2170	1	1 in 1000	·001	·00004	·0006	Paralysis of all 4 limbs followed by convulsions lasting two min- utes.
10	2200	—	—	—	—	—	
11	2160	2	—	·002	·00008	·0012	
14	1920	2	1 in 500	·004	·0002	·0028	
15	1860	—	—	—	—	—	Died next night.
17	1570	—	—	—	—	—	

TABLE IV.—FORMIC ALDEHYD.

RABBIT No. 8.

Date.	Weight in gms.	Dose. cc.	Dilution.	Gms. F. A.	Gms. F. A. per 100 gms.	Percent- age in blood.	Remarks.
M. 6	1320	3	1 in 125	·024	·0018	·025	
8	1320	4	"	·032	·021	·033	
9	1300	{ 3 3 }	"	·048	·0036	·05	
10	1270	4	1 in 62·5	·064	·005	·068	
13	1290	3	"	·048	·0037	·051	
14	1280	3	1 in 31 28	·096	·0074	·102	Died imme- diately. Clot- ting in jugulars and right ven- tricle, bladder engorged.

RABBIT No. 9.

M. 15	1700	2	1 in 50	·04	·0024	·033	
16	1720	$\left\{ \begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right\}$	"	·08	·0047	·065	
17	1730	3	"	·06	·0035	·047	
20	1680	$\left\{ \begin{smallmatrix} 3 \\ 3 \end{smallmatrix} \right\}$	"	·12	·0075	·1	
21	1600	—	—	—	—	—	Ears very œdematous, local gangrene—killed.

RABBIT No. 10.

M. 21	2500	4	1 in 50	·08	·0032	·043	Died immediately. No clotting of blood.
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RABBIT No. 11.

M. 22	2110	$\left\{ \begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right\}$	1 in 62.5	.064	.003	.042	<p> Injections abandoned owing to oedema of ears. No loss of weight followed. </p>
26	2110	—	—	—	—	—	
J. 3	2370	$\left\{ \begin{smallmatrix} 3 \\ 3 \end{smallmatrix} \right\}$	1 in 65	.092	.004	.053	
4	2310	—	—	—	—	—	
12	2380	—	—	—	—	—	
19	2510	—	—	—	—	—	

TABLE IV.—continued

RABBIT No. 12.

Date,	Weight in gms.	Dose cc.	Dilution.	Gms. F.A.	Gms. F.A. per 100 gms.	Percent- age in blood	Remarks
J. 9	1930	$\begin{Bmatrix} 2 \\ 2 \end{Bmatrix}$	1 in 65	·064	·003	·045	Ears very œde- matous. Injections discontinued.
10	1890	$\begin{Bmatrix} 3 \\ 3 \end{Bmatrix}$	"	·092	·005	·066	
11	1860	$\begin{Bmatrix} 3 \\ 3 \end{Bmatrix}$	"	·092	·005	·066	
12	1880	—	—	—	—	—	
17	2040	—	—	—	—	—	

RABBIT No. 13.

J. 26	1600	2	1 in 65	·032	·002	·026	Mucous dis- charge from nose immedi- ately after injection.
27	1570	—	—	—	—	—	Mucous dis- charge as before.
30	1590	2	"	·032	·002	·026	
Jy. 1	1620	—	—	—	—	—	Mucous dis- charge as before.
2	1650	2	"	·032	·0019	·0264	
3	1560	—	—	—	—	—	Injections dis- continued owing to steady loss of weight.
4	1530	1	"	·016	·001	·0158	
5	1540	—	—	—	—	—	
7	1480	—	—	—	—	—	
8	1430	1	"	·016	·0011	·0158	
9	1450	—	—	—	—	—	
10	1450	1·5	"	·024	·0016	·0226	
11	1400	—	—	—	—	—	
30	1150	—	—	—	—	—	

RABBIT No. 14.

Jy. 16	2200	1	1 in 100	·01	·00045	·0062	Weight fell steadily till August 7th. Then rose.
17	2170	—	—	—	—	—	
18	2250	1	"	·01	·00044	·0061	
19	2250	—	—	—	—	—	
21	2310	1	"	·01	·00043	·006	
22	2280	—	—	—	—	—	
23	2330	1	"	·01	·00043	·006	
24	2290	—	—	—	—	—	
25	2230	1	"	·01	·00044	·0061	
29	2230	1	"	·01	·00044	·0061	
A. 7	2040	—	—	—	—	—	
13	2170	1	"	·01	·00046	·0063	
14	2110	—	—	—	—	—	

TABLE V.—CHINOSOL.

RABBIT No. 15.

Date.	Weight in gms.	Dose. cc.	Dilution.	Gms. Chin.	Gms. Chin. per 100 gms.	Percent- age in blood.	Remarks.
M. 8	1830	2	1 in 200	·01	·0006	·008	
9	1900	3	"	·015	·0007	·01	
10	1930	4	"	·02	·0012	·016	
12	1890	$\left\{ \begin{smallmatrix} 3 \\ 3 \end{smallmatrix} \right\}$	1 in 100	·06	·003	·04	
13	1890	3	"	·03	·0015	·02	
14	1860	$\left\{ \begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right\}$	1 in 50	·08	·004	·06	
15	1880	2	"	·04	·002	·03	
16	1890	$\left\{ \begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right\}$	"	·08	·004	·06	
17	1900	2	1 in 30	·06	·003	·04	
20	1930	$\left\{ \begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right\}$	"	·12	·006	·085	Slight paralysis of hind quar- ters after each injection, last- ing 5 to 10 minutes.
21	1930	2	1 in 20	·1	·005	·07	Paralysis all 4 limbs, lasting 5 minutes.
22	1920	—	—	—	—	—	
26	1890	—	—	—	—	—	

RABBIT No. 16.

M. 22	1680	2	1 in 25	·08	·004	·065	Paralysis all 4 limbs, lasting 5 minutes.
26	1680	—	—	—	—	—	
30	1720	2	1 in 40	·05	·002	·039	Slight paralysis hind quarters.
J. 6	1820	3	1 in 50	·06	·003	·045	Slight paralysis followed by convulsions.
7	1800	—	—	—	—	—	
10	1810	—	—	—	—	—	
16	1810	2	"	·04	·002	·03	Slight transi- tory paresis of hind quarters.
17	1830	—	—	—	—	—	

TABLE V.—continued.

RABBIT No. 17.

Date.	Weight in gms.	Dose cc.	Dilution.	Gms. Chin.	Gms. Chin. per 100 Gms.	Percent- age in blood.	Remarks.
J. 26	1720	2	1 in 50	·04	·0023	·032	Slight paraly- sis.
27	1680	—	—	—	—	—	
30	1700	1·4	"	·028	·0017	·023	
Jy. 1	1720	—	—	—	—	—	
2	1680	1·6	"	·034	·002	·027	Slight paresis, hardly notice- able.
3	1700	—	—	—	—	—	
4	1690	1·5	"	·03	·0018	·0242	A little drag- ging of hind quarters.
5	1710	—	—	—	—	—	
7	1510	—	—	—	—	—	
8	1640	1·5	"	·03	·0018	·025	Very slight paralysis.
9	1670	—	—	—	—	—	
10	1660	1·5	"	·03	·0018	·025	
11	1650	—	—	—	—	—	
14	1540	1·5	"	·03	·002	·026	Slight paraly- sis.
15	1510	—	—	—	—	—	
17	1430	—	—	—	—	—	
30	1500	—	—	—	—	—	

RABBIT No. 18.

Jy. 15	2320	1	1 in 100	·01	·00042	·0058	
16	2340	—	—	—	—	—	
17	2350	1	"	·01	·00042	·0058	
18	2330	—	—	—	—	—	
19	2300	1	"	·01	·00043	·006	
21	2440	1	"	·01	·00041	·0056	
22	2429	—	—	—	—	—	
23	2390	1	"	·01	·00041	·0057	
24	2340	—	—	—	—	—	Steady fall in weight till August 1st.
A. 1	2010	—	—	—	—	—	
6	2030	1	"	·01	·0005	·0067	
7	1970	—	—	—	—	—	
14	1960	—	—	—	—	—	

TABLE VI.—CHINOSOL AND FORMALIN.

RABBIT No. 19.

Date.	Weight in gms.	Dose, cc.	Dilution.	Gms.	Gms. per 100 cc.	Percent- age in blood.	Remarks.
J. 19	1870	3 {	1 in 25 Ch. 1 in 32.5 F.A.	.06 .046	.0032 .0024	.044 .033	Paralysis four limbs.
20	1850	—	—	—	—	—	Paralysis con- tinues.
21	—	—	—	—	—	—	Died during night.

RABBIT No. 20,

J. 30	1580	1 {	1 in 50 Ch. 1 in 65 F.A.	.008 .008	.0005 .0005	.007 .007	
Jy. 1	1430	—	—	—	—	—	Seems weak and ill.
2	1430	.5	"	{ .004 .004	.00028 .00028	.00038 .00038	
3	1450	—	—	—	—	—	
4	1480	.5	"	{ .004 .004	.00027 .00027	.0037 .0037	Continues in bad condition
5	1520	—	—	—	—	—	
7	1480	—	—	—	—	—	
8	1470	.5	"	{ .004 .004	.00027 .00027	.0037 .0037	"
9	1490	—	—	—	—	—	
10	1490	.5	"	{ .004 .004	.00027 .00027	.0037 .0037	Lost weight until July 16th, then slight rise.
16	1260	—	—	—	—	—	
30	1390	—	—	—	—	—	

TABLE VII.—PROTARGOL.

RABBIT No. 21.

Date.	Weight in gms.	Dose cc.	Dilution.	Gms. Prot.	Gms. Prot. per 100 gms.	Percent- age in blood.	Remarks.
M. 27	1920	2	1 in 400	·005	·00026	·004	The ears became bad so injec- tions were discontinued.
28	1910	2	1 in 200	·01	·00052	·008	
29	1870	2	1 in 150	·013	·0007	·009	

RABBIT No. 22.

M. 29	1610	2	1 in 150	·013	·0008	·0112	Paralysis of hind quarters lasting five minutes.
30	1550	2	1 in 100	·02	·0013	·0177	
J. 3	1670	3	"	·03	·0017	·0246	
4	1630	3	"	·03	·0018	·0252	
5	1640	3	"	·03	·0018	·0252	
6	1700	3	1 in 75	·04	·0023	·0323	
7	1680	—	—	—	—	—	
9	1770	3	1 in 50	·06	·0033	·0411	
10	1750	—	—	—	—	—	
11	1750	—	—	—	—	—	
19	1800	—	—	—	—	—	

RABBIT No. 23.

J. 25	1760	2	1 in 100	·02	·0011	·0155	Weight re- mained about same till July 25th
26	1780	—	—	—	—	—	
27	1770	2	"	·02	·0011	·0155	
30	1670	—	—	—	—	—	
Jy. 1	1590	1	"	·01	·0006	·009	
2	1690	—	—	—	—	—	
3	1730	2	"	·02	·0011	·0157	
4	1710	—	—	—	—	—	
5	1730	2	"	·02	·0011	·0157	
7	1760	2	"	·02	·0011	·0155	
8	1660	—	—	—	—	—	
9	1680	2	"	·02	·0012	·0182	
10	1680	—	—	—	—	—	
11	1650	2	"	·02	·0012	·0182	
14	1490	2	"	·02	·0013	·01	

TABLE VII.—continued.

RABBIT No. 24.

Date.	Weight in gms.	Dose cc.	Dilution.	Gms. Prot.	Gms. Prot. per 100 gms.	Percent- age in blood.	Remarks.
J. 15	1940	2	1 in 200	·01	·0005	·007	Steady fall in weight till August 7.
16	1930	—	—	—	—	—	
17	1880	1	"	·005	·00026	·004	
18	1850	—	—	—	—	—	
19	1810	—	—	—	—	—	
21	1830	1	"	·005	·00027	·003	
22	1820	—	—	—	—	—	
24	1810	—	—	—	—	—	
25	1780	1	"	·005	·00028	·0038	
29	1880	1	"	·005	·00026	·004	
A. 7	1700	—	—	—	—	—	
13	1870	1	"	·005	·00026	·004	
14	1840	—	—	—	—	—	

TABLE VIII.—SODIUM TAUROCHOLATE.

RABBIT No. 25.

Date.	Weight in gms.	Dose cc.	Dilution	Gms. S.T.	Gms. S. T. per 100 gms.	Percent- age in blood.	Remarks.
Jy. 10	1810	1	1 in 1,000	·001	·00005	·0007	Weight fell steadily till July 31.
11	1830	2	"	·002	·0001	·0014	
14	1670	2	1 in 500	·004	·00024	·0033	
15	1640	—	—	—	—	—	
16	1670	—	—	—	—	—	
17	1750	—	—	—	—	—	
18	1830	1	1 in 1,000	·001	·00005	·0007	
19	1750	—	—	—	—	—	
21	1880	1	"	·001	·00005	·0007	
22	1840	—	—	—	—	—	
23	1800	1	"	·001	·00005	·0007	
24	1760	—	—	—	—	—	
31	1720	—	—	—	—	—	
A. 1	1740	—	—	—	—	—	
6	1650	1	"	·001	·00006	·0008	
7	1710	—	—	—	—	—	
13	1770	1	"	·001	·00005	·0007	
14	1730	—	—	—	—	—	

TABLE IX.

OXY-CYANIDE OF MERCURY. (R. 26). 1 in 1000.

Day.	Weight in gms.	Dose cc.	Gms. drug.	Gms. per 100 gms. b.w.	Percentage in blood.
1	1730	1	·001	·00005	·0007
2	1790	1	·001	·00005	·0007
3	1710	1	·001	·00005	·0007
4	1620	1	·001	·00005	·0008
5				<i>Found dead.</i>	

FORMIC ALDEHYD. (R. 27). 1 in 100.

1	1500	1	·01	·0006	·009
2	1550	1	·01	·0006	·009
3	1500	1	·01	·0006	·009
4	1530	1	·01	·0006	·009
5				<i>Found dead.</i>	

CHINOSOL. (R. 28). 1 in 100.

1	1960	2	·02	·001	·014
2	2020	1	·01	·0005	·006
3	2050	1	·01	·0005	·006
4	2080	1	·01	·0005	·006
5				<i>Found dead.</i>	

PROTARGOL. (R. 29). 1 in 200.

1	1720	1·5	·0075	·0004	·006
2	1760	1	·005	·00028	·0039
3	1690	1	·005	·00029	·004
4	1750	1	·005	·00028	·0039
5	—	—	—	—	<i>Survived.</i>

SODIUM TAUROCHOLATE. (R. 30). 1 in 1000.

1	1600	1	·001	·00006	·0008
2	1650	1	·001	·00006	·0008
3	1590	1	·001	·00006	·0008
4	1630	1	·001	·00006	·0008
5					<i>Survived.</i>

TABLE X.

PROTARGOL. (R. 29). 1 in 200.

Day.	Weight in gms.	Dose cc.	Gms. drug.	Gms. per 100 gms.	Percentage in Blood.
8	1880	1	·005	·0002	·003
9	1900	1	·005	·0002	·003
10	1910	1	·005	·0002	·003
11	1930	1	·005	·0002	·003
12	1850	—	—	—	<i>Died</i>

SODIUM TAUROCHOLATE. (R. 30). 1 in 1,000.

8	1740	1	·001	·00005	·0007
9	1750	1	·001	·00005	·0007
10	1670	1	·001	·00006	·0008
					<i>Died</i>

CONTROL. (R. 31).

1	1550	·5 cc. Anthrax Emul-ion (α) intra-peritoneally.
2	1580	
3	1550	
4	1550	
5	1570	
6	1590	
7	1590	
8	1670	·5 cc. Anthrax Emulsion (β) intra-peritoneally.
9	1690	
10	1670	
11	1630	
		<i>Died.</i>

NOTE.—The undiluted anthrax emulsion was labelled β , that diluted with equal quantity of broth, α .

TABLE XI.

OXY-CYANIDE OF MERCURY (R. 32). 1 in 1000.

Day.	Weight in gms.	Dose cc.	Gms. drug	Gms. per 100 gms.	Percentage in blood.
1	1480	·75	·00075	·00005	·0007
2	1510	·75	·00075	·00005	·0007
3	1460	—	—	<i>Died this morning.</i>	

FORMIC ALDEHYD. (R. 33). 1 in 100.

1	1470	1·5	·015	·001	·014
2	1470	1·5	·015	·001	·014
3	1440	1·5	·015	·001	·014
4				<i>Died this morning.</i>	

CHINOSOL. (R. 34). 1 in 100.

1	1450	·75	·0075	·0005	·007
2	1430	·75	·0075	·0005	·007
3	1470	·75	·0075	·0005	·007
4	1430	·75	·0075	·0005	·007
					Died.

PROTARGOL. (R. 35). 1 in 200.

1	1540	1	·005	·0003	·004
2	1570	1	·005	·0003	·004
3	1550	1	·005	·0003	·004
					Died.

SODIUM TAUROCHOLATE. (R. 36). 1 in 1000.

1	1910	1	·001	·00005	·0006
2	1900	1	·001	·00005	·0006
3	1790		<i>Died about noon.</i>		

CONTROL. (R. 37).

1	1580	·5 cc.	Anthrax Emuls. (β) intra-peritoneally.		
2	1570				
3	1580				
4	—		<i>Died this morning.</i>		

TABLE XII.

FORMIC ALDEHYD. (R. 38). 1 in 55.

Day.	Weight in gms.	Dose cc.	Grms. drug.	Gms. drug per 100 gms.	Percentage in blood.
1	1420	2	·03	·0021	·028
		2	·03	·0021	·028
		2	·03	·0021	·028
2	1380	3	·046	·003	·045
		2	·03	·00217	·03
3	1320	2·5	·039	·0029	·041
		2·5	·039	·0029	·041
4	1270	<i>Died during following night.</i>			

CHINOSOL. (R. 39). 1 in 50.

1	1510	2	·04	·003	·035
		2	·04	·003	·035
		2	·04	·003	·035
2	1500	3	·06	·004	·054
		2	·04	·003	·035
3	1370	3	·06	·0044	·06
		<i>Died.</i>			

CONTROL. (R. 40).

1	1340	1 cc. Pneumococcus Emulsion.
2	1200	
3	1170	
4	1130	
5	—	
6	—	<i>Died to-day.</i>

EOSINOPHILIA IN SKIN DISEASES.

BY HERBERT FRENCH, M.B., B.CH. OXON.,
M.R.C.P. LOND.

(The numbers in brackets following authors' names refer to the works quoted at the end of the paper.)

IN discussions concerning the pathology of the coarsely granular eosinophile cells in human blood, this variety of leucocyte is stated to be increased in number, relatively to the other forms of white corpuscles, in conditions which may be classed under the following three main headings:—

1. True asthma.
2. Certain internal parasitic affections.
3. Certain skin diseases.

It is here proposed to investigate more fully the question of eosinophilia in skin affections; leaving on one side eosinophilia in asthma, and in internal parasitic diseases.

In text-books of medicine the subject "eosinophilia" frequently escapes mention altogether; and, in those books which refer to it, the accounts of its occurrence in skin diseases are often vague.

For example, Phrear (12), after speaking of pemphigus, says: "Other forms of skin disease, notably psoriasis and urticaria, may be associated with an increase in the coarsely granular blood cells; and all I would say about these is that the leucocytosis appears to depend on the superficial extent of the cutaneous affection, rather than on its nature or severity."

Ehrlich and Lazarus (6) quote Canon (3) as having found as many as 17 per cent. of eosinophile leucocytes in skin diseases, especially prurigo and psoriasis; and also as having noted that the increase of the eosinophile cells is connected with the degree of extension of the disease, rather than with its nature or local intensity.

Cabot (2) states that the coarsely granular eosinophile cells in the blood are relatively increased in a large number of diseases, including the following affections of the skin: urticaria, pellagra, dermatitis herpetiformis, and pemphigus (constantly); some varieties of herpes, prurigo, eczema, lymphoderma perniciosum; the exanthems of scarlet fever and syphilis (*not* measles or small-pox), ichthyosis, lupus, myxœdema. And, in another paragraph he states that "in cases of doubtful syphilis eosinophilia combined with lymphocytosis speaks in favour of syphilis."

Gilbert (8), in a French text-book of medicine, states, without quoting figures, that coarsely granular eosinophile cells in the blood are relatively increased in lèpre, syphilis, pemphigus, dermatitis pustulosa of Neumann, dermatitis végétante of Hallopeau, pemphigus foliacé, urticaria, prurigo, and chronic eczema.

The extent of eosinophilia to be expected in each particular skin disease; the number of patients examined; and the proportion of them in whom no eosinophilia occurred; these are important points which are not mentioned. Although there are numerous original publications upon the subject, comparatively few statistics of differential leucocyte counts in skin diseases are given in them. It is largely upon the figures given by Neusser (10) and his pupils (15) that the above general

statements are based. The following are records of actual counts, gathered from the original papers of different observers :—

(In no instance was mention made of the total number of leucocytes counted.)

Observer's name.	Skin disease.	Percentage of eosinophile cells.
Zappert (15) ...	Acne vulgaris ...	1·20 per cent.
" ...	Addison's disease ...	8·70 "
" ...	Cutaneous burn ...	2·75 "
" ...	" " ...	0·76 "
Canon (3) ...	Eczema ...	14·19 "
Zappert ...	" ...	9·75 "
" ...	" ...	5·66 "
Canon ...	" ...	5·00 "
Zappert ...	" ...	4·07 "
" ...	" ...	1·73 "
" ...	" ...	1·18 "
" ...	" ...	0·72 "
" ...	Erythema, from salol	2·57 "
" ...	Erythema multiforme	4·75 "
" ...	" ...	4·27 "
" ...	" ...	1·93 "
" ...	Herpes zoster ...	2·70 "
" ...	" ...	2·62 "
" ...	Lichen ruber planus	3·28 "

Observer's name.	Skin disease	Percentage of eosinophile cells.
Zappert	Lupus vulgaris ...	12·24 per cent.
"	"	7·36 "
"	"	5·07 "
"	"	4·27 "
"	"	2·37 "
"	"	2·19 "
"	"	2·03 "
"	"	1·24 "
"	"	1·23 "
"	"	1·20 "
<hr/>		
"	Measles	8·72 "
"	"	4·27 "
"	"	3·23 "
"	"	3·15 "
"	"	1·93 "
<hr/>		
"	Pemphigus	33·02 "
"	"	29·28 "
"	"	14·15 "
"	"	5·95 "
"	"	3·00 "
"	"	1·64 "
<hr/>		
Canon	Prurigo, severe ...	11·21 "
Three different counts in the same patient, the blood being taken on different dates		10·93 "
		10·00 "
<hr/>		
Zappert	Psoriasis	9·88 "
"	"	5·23 "
Canon	"	4·75 "
The same patient, blood taken on different dates		6·90 "
		4·91 "
		4·00 "
		4·00 "
Two counts from another patient, upon different dates		10·53 "
		17·00 "

Observer's name.			Skin disease.			Percentage of eosinophile cells.	
Canon	...	...	Scarlet fever...	...	...	7.70	per cent.
"	...	...	"	...	...	5.31	"
"	...	...	"	...	...	3.19	"
Weiss (14)	...	...	"	...	...	2.40	"
Zappert	...	...	"	...	...	2.23	"
"	...	...	"	...	...	2.00	"
"	...	...	"	...	...	1.51	"
"	...	...	"	...	...	1.00	"
"	...	...	"	...	...	0.42	"
<hr/>							
"	...	...	Sclerodermia	...	...	9.47	"
"	...	...	"	...	...	7.71	"
"	...	...	"	...	...	4.51	"
<hr/>							
Weiss	...	...	Syphilis, congenital...	...	...	6.50	"
"	...	...	"	"	...	1.00	"
Zappert	...	...	"	secondary	...	4.91	"
"	...	...	"	"	...	4.00	"
Canon	...	...	"	"	...	4.00	"
Zappert	...	...	"	"	...	3.13	"
Canon	...	...	"	"	...	2.23	"
Zappert	...	...	"	"	...	1.93	"
"	...	...	"	"	...	1.88	"
"	...	...	"	"	...	0.97	"
Canon	...	...	"	tertiary	...	5.50	"
"	...	...	"	"	...	3.38	"
"	...	...	"	"	...	3.01	"
<hr/>							
Zappert	...	...	Urticaria, chronic	...	...	2.04	"

Many other observers record the fact that they have found eosinophilia in skin diseases, but no actual figures are given in their papers. Rille (13), for example, says that "there are skin affections in which the eosinophile cells reach a very high figure,

for example, eczema, pemphigus, prurigo. In other skin diseases the results are by no means constant." In a few cases of psoriasis he found considerable increase, but in other cases extensively affected no alteration in the eosinophile percentage. Nor did he find any increase in lupus vulgaris, except after injection of tuberculin when there was great increase. He gives no statistics, and it would serve no useful purpose to mention all the other observers who state that they have found eosinophilia in skin diseases, but give no details of the differential leucocyte counts.

Before discussing either the figures already quoted, or those obtained in the present investigation, a few words must be said about differential leucocyte counts in apparently healthy persons; and an attempt made to decide what percentage of coarsely granular eosinophile cells is needed to constitute eosinophilia. Cabot (2) states that, in the blood of healthy adults, the proportions of the different varieties of leucocytes are:—

Small lymphocytes	20 to 30 per cent.
Large lymphocytes	4 " 8 "
Polymorphonucleated cells ...	62 " 70 "
Eosinophile cells	0.5 " 4 "

Lazarus Barlow (9) says: "In human blood the hyaline cells and lymphocytes constitute about 20 to 30 per cent. of the total number of leucocytes, the finely granular oxyphil cells," *i.e.* the polymorphonucleated, "constitute 50 to 70 per cent., and the coarsely granular oxyphil," *i.e.* eosinophile, "constitute 1 to 5 per cent. It is impossible to give more definite proportions than the above, as the variations are very great; but it may roughly be said that in human physiological blood the vast bulk of leucocytes consists of finely granular oxyphil cells and lymphocytes, and that if the proportion of the former be low, there is generally a greater proportion than normal of lymphocytes."

It may perhaps be assumed therefore, that any proportion of coarsely granular eosinophile cells less than 5 per cent. is within the normal limits; or, that there must be over 5 per cent. of coarsely granular eosinophile cells to constitute eosinophilia;

and it would probably not be called marked eosinophilia unless there were 10 per cent.

It will be seen that, of the above sixty-nine patients with skin diseases, only twenty-one, or less than one-third, showed eosinophilia; three out of eight with eczema; three out of ten with lupus vulgaris; one out of five with measles; four out of six with pemphigus; three out of four with psoriasis; two out of nine with scarlet fever; two out of three with sclerodermia; two out of thirteen with syphilis; and none at all with acne vulgaris, cutaneous burns, erythema from salol, erythema multiforme, herpes zoster, lichen ruber planus, chronic urticaria. And the only cases in which it was marked, six in all, were one case out of eight with eczema; one out of ten with lupus vulgaris; three out of six with pemphigus; and one out of four with psoriasis.

In the present investigation even fewer patients suffering from skin affections were found to have eosinophilia. It may be urged that, if other methods of staining had been used, more eosinophile cells would have been found. But the investigation was begun in the hope that eosinophilia would be the rule instead of the exception, at any rate in some of the skin diseases. Various methods of staining were tried. Before the final method was adopted, many films were examined, some after fixing by heat, some by absolute alcohol, some by absolute alcohol and ether, some by formalin, some by corrosive sublimate; various stains were tried, methylene blue both warm and cold, Jenner's stain, Ehrlich's triple stain, various kinds of hæmatoxylin, eosine both in alcoholic and in aqueous solution. Though several of these methods sometimes gave extremely beautiful films, pictures to look upon, none was found so certain in its results as the following, which, except in a few cases, has been employed throughout:—

Long cover slips were used, cleaned by boiling in chromic acid solution, washing in water, and transferring to absolute alcohol; and then passed through a spirit flame to burn away the latter. Blood was obtained from the lobule of the ear, a small drop being received upon the free edge of a cigarette paper

cut to the width of the cover slip, and then smeared evenly along the latter from end to end. As soon as dry, the film was transferred to a mixture of equal parts of absolute alcohol and sulphuric ether; fixed in this for four and twenty hours; washed in tap water to remove the alcohol and ether, and immersed in full-strength Delafield's hæmatoxylin solution for exactly five minutes. The stain was removed by running tap water; copious washing quickly removes the stain from everything except the nuclei, and the latter are "blued" by the slight alkalinity of the tap water. The film was then immersed in saturated watery solution of eosine for thirty seconds, again washed in running tap water, dried with filter papers, and mounted in Canada balsam.

This method never failed. The coarse granules in the eosinophile cells showed up with the greatest distinctness; the polymorphonucleated cells showed no granules at all, an advantage which is not shared by those methods of staining which give them a finely granular appearance.

In all cases the differential leucocyte count was made with a one-twelfth inch oil immersion lens and a Leitz mechanical stage. Consecutive fields were counted until one thousand or more successive leucocytes had been enumerated in each case. To count less than one thousand is to introduce the possibility of considerable error in the percentages. Even in counts of a thousand, there is a certain unavoidable error: and in this the present writer quite agrees with Boycott and Haldane (1), who say: "The differential count would appear at first sight to be liable to but a very small error; but successive counts of five hundred or a thousand cells in the same film show that the successive results may vary a good deal in cases where there is no question of any error of judgment in assigning each cell to its appropriate class. Thus, in two cases the figures for the neutrophiles," *i.e.*, polymorphonucleated cells, "in each of four successive thousands of white cells were:—

59.2	55.5	55.2	53.6 per cent.
35.8	32.7	38.7	34.8 "

In view of a tendency to lay too much stress on small differences in blood counts it seems well to call attention to the fact that an error of method is present, and that it is not altogether negligible in magnitude."

It is sometimes very striking to see how unevenly the leucocytes are distributed in the blood film. Thousands and thousands of red cells may be passed by with not one leucocyte amongst them; and then suddenly, in another part of the same film, quantities of leucocytes may be found. It would seem that the leucocytes cling to the cigarette paper longer than do the red corpuscles, and they are usually found in largest number towards the end of the film. It is not impossible that one kind of leucocyte clings to the paper more than another, with the result that in one part of the film a particular form of leucocyte would preponderate, and in another part a different form. The general impression left after counting a great many films is that this is so, and therefore it is essential, in making the differential count, to enumerate as wide an area of the slide as possible, and not to restrict the examination solely to those parts which are perfectly thin.

Little need be said in regard to the names of the leucocytes here employed. That there are four main types of white corpuscle in the blood most are agreed, though the names used by different authors are very various. The four names—

Small lymphocyte,
Large lymphocyte,
Polymorphonucleated cell,
Coarsely granular eosinophile cell,

clearly indicate these four types, and the various other names which have been used for them need not be enumerated. There is no difficulty in putting the polymorphonucleated and the coarsely granular eosinophile cells into their proper class directly they are seen, but there is a certain difficulty in the case of the small and the large lymphocytes. In this respect, again, the present writer quite agrees with Boycott and Haldane (1). A great many of them are relegated without hesitation to the class "Small lymphocytes," each being a small cell with deeply

staining round nucleus, and little protoplasm. Many others are typical "Large lymphocytes," each being a big cell with a more or less kidney-shaped nucleus, and abundant pale protoplasm. But between these there are cells which are intermediate in character, frequently of moderate size, with a spherical, deeply staining nucleus, and a fair amount of pale protoplasm. These may really be intermediate cells, small lymphocytes growing up into large, a view which is opposed by Ehrlich, or they may be a distinct variety of cell; or a third view is possible, namely, that the small lymphocyte is sometimes fixed upon the slide in a "bunched up" state, so that it seems to be nearly all nucleus, and at other times it is spread out flat, like a pancake, and then seems to have proportionately greater size and more protoplasm. In the present investigation an endeavour was at first made to count all such in a separate class, as "Intermediate lymphocytes," but so great was the personal equation in determining which belonged to this class and which did not, that the attempt was given up; all such cells have been counted as "Small lymphocytes," and all those which are classed as "Large lymphocytes," were typical cells, often known by the name of "Large hyaline cells."

Each differential leucocyte count occupied, upon the average, about two hours after the film had been stained and mounted. Possibly the labour entailed, and the strain it is upon the eyes, are the reasons why so few differential leucocyte counts have yet been made and published. The patients examined were almost entirely from the Out-patient department, so that no further examination of the blood, beyond the making of films, was possible. In no case was there any marked anæmia, nor any prominent leucocytosis. In most cases the diagnosis of the skin lesion was made by Sir Cooper Perry, Physician to Guy's Hospital.

- The results obtained are arranged in tabular form, according to the alphabetical order of the skin disease.

Altogether ninety patients were examined; in only thirteen was there eosinophilia according to the standard laid down on page 86; and in only four was the eosinophilia marked. It is true that ninety cases are too few to draw wide conclusions

from; more statistics, and by other observers, are needed to compare with these, and with those of Zappert, Canon, and Weiss already given. Apparently eosinophilia is far from being a characteristic of skin lesions in general; and, in the few cases in which it does occur, it cannot be said with certainty that the skin disease is the cause. For example, in only one patient out of thirteen suffering from eczema did the eosinophiles reach 10 per cent.; it is possible that in him some other cause than the skin disease was at work, a tape worm, for example, or an old infection with *ankylostomum duodenale* acquired perhaps in India.

Unfortunately, no case of pemphigus came under observation. Apparently this condition is often associated with eosinophilia, as Zappert's figures show (see page 84); but even in this disease the eosinophile cells were normal in two patients out of six. Kaposi (4) found "numerous" eosinophiles in fourteen cases of pemphigus, but the figures are not given. Apparently eosinophilia is to be expected in pemphigus, but it is not always present.

In cases of dermatitis herpetiformis, Gibson (7) states that eosinophile cells increase in the blood, and are also present in the bullæ; and in the only case examined in the present research, case 7, this statement is borne out; 13·5 per cent. of eosinophile cells were found. It would be exceedingly interesting to examine other persons suffering from this disease whenever an opportunity should arise, and discover whether eosinophilia is always present. It may be of diagnostic value; and suggests a similarity in pathology between dermatitis herpetiformis and true pemphigus. It is quite impossible, however, without more data, to do more than suggest that these things *may* be so, and to urge that a differential leucocyte count should be made on all patients who have either of these skin affections.

In regard to the other skin conditions examined, no case of eosinophilia was found amongst the individuals who suffered from:—

Acne rosacea.	Lupus vulgaris.
Addison's disease.	Molluscum contagiosum.
Alopecia areata.	Pityriasis sicca.
Erythema simplex.	Sclerodermia.
Erythema nodosum.	Syphilis, congenital.
Herpes labialis.	Tinea tonsurans.
Herpes zoster.	Tinea versicolor.
Impetigo.	Urticaria.
Lupus erythematosus.	Veldt sores.

Of the remainder, there was slight eosinophilia in the only case of application dermatitis (oxalic acid) examined; in four cases of eczema out of thirteen; in one case of lichen planus out of two; in three cases of psoriasis out of twenty; in one case of scabies out of six; in two cases of syphilis out of five; and in the only case of xanthoma diabeticorum which came under observation.

It will be seen, from the short abstracts of the extent, intensity, and duration of the skin affections, that none of these factors seem to bear any relation to the amount of eosinophilia. In the figures for psoriasis, for example, one of the most severely and chronically affected patients, case 42, had only 0.5 per cent., whilst the eosinophilia was greatest, 6.6 per cent., in case 59, where the skin disease was neither severe nor very extensive, nor of long standing. The same holds good for eczema, as may be seen on comparing, for example, case 8, with cases 17 and 18. Canon (3) has made this statement: "It seems less the kind of skin disease, or its local intensity, than the duration of the disease process, which influences the increase in eosinophiles." This dictum is often referred to as "Canon's law." Certainly, in the present research, the facts do not support it.

The absence of eosinophilia in tinea tonsurans, tinea versicolor, scabies, and alopecia areata, is interesting in that these affections, or at least the first three, are of parasitic origin. That certain internal parasites, for instance, ankylostomum duodenale (1), Bilharzia hæmatobia (5), trichina spiralis (11), filariasis (5), frequently lead to eosinophilia is well established; and by

analogy it was hoped that parasitic skin diseases would do so likewise; the surmise has been negatived.

Only one case of xanthoma diabeticorum came under observation; the eosinophilia, 12·4 per cent., is not the result of diabetes mellitus alone, as shown by case 90; it cannot, however, be attributed at once to the xanthoma; other agencies, possibly parasitic, may have been at work in case 89. It will be very interesting to learn what other observers find, should they make differential leucocyte counts in other patients suffering from this affection. The cases are so rare that no single observer is likely to see a large number.

In the first patient with syphilis examined, case 73, 10 per cent. of eosinophiles were found, and it was hoped that a similar eosinophilia might be universal in tertiary affections of the skin. It is frequently difficult to diagnose at once between a tertiary lesion and such other affections as eczema or psoriasis; not infrequently the diagnosis can only be decided by time and the effect of mercury and potassium iodide. It would be of great service if an increased percentage of eosinophile cells could be relied upon in deciding the question at the first visit. The number of patients in whom opportunity has arisen to make a blood count has been small; and more statistics would be very interesting; but as far as the present figures go the eosinophilia in syphilis is by no means constant enough to be used as a diagnostic test in this way.

The changes found in the relative proportions of the other varieties of leucocytes may be summarised in a few words.

The percentages of large lymphocytes throughout are within the normal physiological limits.

A general survey of the results shows that the small lymphocytes tend to be over 30 per cent. rather than under it; their proportion is particularly high, 82 per cent. and 52 per cent., in both the cases of congenital syphilis; a feature pointed out by Cabot (2). In the four cases of urticaria, also, the small lymphocytes showed great relative increase, being 43 per cent.; 40 per cent.; 59 per cent.; and 46 per cent.; perhaps this affection is constantly accompanied by lymphocytosis. In none

of the other affections investigated were the lymphocyte counts constantly high, though in seventeen cases out of the remaining eighty-four they constituted 40 per cent. and over. This increase apparently bears little relation to age, though it has been observed by Julius Weiss (14) that children often have a relative increase of lymphocytes. Such increase has been but slightly marked in the children in the present instance. In those of ten years of age and under the lymphocytes numbered 45, 32, 23, 37, 29, 31, 34, 16, 43, 28, 28, 49, 39, 36, 32, 40, and 30 per cent.; whilst in some adults the figures were much higher, as in cases 26 and 50, where 59 per cent. and 51 per cent. were found at twenty-four and fifty-three years of age respectively.

In regard to the polymorphonucleated cells, these varied in percentage from 32 per cent. (two cases) to 80 per cent. (one case). So wide and inconstant are the variations that little deduction can be drawn from them. Roughly it may be said that their proportion is as often below 60 per cent. as above it; in other words, that the percentage of this variety of leucocyte is, upon the whole, diminished, and the diminution in polymorphonucleated cells approximates, broadly speaking, to the increase in the small lymphocytes.

CONCLUSIONS.

The conclusions drawn from the differential leucocyte counts of ninety patients suffering from various skin affections are:—

That, in these ninety patients:—

- (1) There were a very large number who showed no eosinophilia at all.
- (2) There were a few who showed slight eosinophilia.
- (3) There were only four who showed marked eosinophilia.

- (4) There were none of the skin conditions investigated in which eosinophilia was not the exception rather than the rule ; except in :—
 - (a) Pempighus.
 - (b) Dermatitis herpetiformis ; and possibly in
 - (c) Xanthoma diabeticorum.
- (5) There were a large number of skin affections in which, as far as the research went, no single case of eosinophilia occurred. The list is given on page 92.
- (6) There were parasitic skin diseases showing no eosinophilia.
- (7) There were a few individuals suffering from psoriasis, from éczema, or from syphilis, who showed eosinophilia, but many who showed none, so that, owing to its erratic occurrence, the presence or absence of eosinophilia will not serve as a means of diagnosis between syphilitic affections and the other two.
- (8) There was no evidence in favour of " Canon's law."
- (9) There was, upon the whole, but with individual exceptions, a relative diminution of polymorphonucleated cells.
- (10) There was a tendency to a relatively high proportion of lymphocytes.
- (11) The fall in percentage of polymorphonucleated cells was approximately equalled by the rise in percentage of small lymphocytes.
- (12) The lymphocytosis was not constant, except in the patients suffering from :—
 - (a) Congenital syphilis.
 - (b) Urticaria.in each of which conditions it was well marked.

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LIST OF CASES.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
1	Elizabeth R., 42	ACNE ROSACEA— Very extensive on nose, cheeks, forehead. Several pustules. Present sixteen years. Very extensive across nose and cheeks; some pustules. Has had it two years. It has been worse than it is now.	Dyspepsia	38	6.1	55	0.9	1042
2	Nellie S., 27 ...		Dyspepsia	28	7.0	64	1.0	1076
3	Walter T., 26 ...	ADDISON'S DISEASE— Tachycardia, weakness, and pigmentation. Latter general, and on buccal mucosa.	None ...	42	3.9	52	2.1	1000
4	Thomas W., 31	ALOPECIA AREATA— About one-third of scalp bare, in islands. Other islands in beard. Had it two years. Five areas of scalp bare, the largest three inches in diameter. Had it one year. Treatment for six months.	None ...	48	18.0	33	1.0	1034
5	Rosina K., 15 ...		None ...	22	7.3	67	3.7	1085
6	Margaret K., 32	APPLICATION DERMATITIS— Very acute and extensive; vesicular and pustular; on hands, forearms, arms, feet, legs, thighs. Out nine days. Due to oxalic acid used in brass cleaning.	None ...	16	4.2	74	5.8	1000

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
7	Emily S., 41 ...	DERMATITIS HERPETIFORMIS; OR HYDROA GESTATIONIS— Very extensive crops of herpetiform vesicles, some pustular, on hands, forearms, ears, abdomen. Less extensive on feet and legs. Seventh attack, with successive pregnancies.	Pregnant three months	11	4.5	71	13.5	1022
8	Henry S., 51 ...	ECZEMA— All over, except back. Thirty years ago had it for seven years. This time had it nine months; acute recently.	? Gout ...	29	9.2	61	0.8	1040
9	Marian B., 44 ..	Acute. On hands, forearms, arms, thighs, legs, shoulders, back. Has had it off and on eighteen months; also four years ago.	None ...	32	10.8	55	2.2	1038
10	Alfred H., 21 ...	Seborrhœic dermatitis. Very bad for ten days; also had it four months ago. No treatment.	None ...	32	3.8	62	2.2	1041
11	Elizabeth R., 19	Face and both forearms. First attack. Acute, only present a few days. No treatment.	None ...	38	4.7	55	2.3	1070
12	George T., 35 ...	All over legs, abdomen, arms. Had it fourteen years off and on. Better for five months, now bad again.	None ...	39	1.7	57	2.3	1073

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
ECZEMA—continued								
13	Elizabeth P., 35	Very acute. All four limbs, abdomen, head and neck affected. Present six days only. Had it five years ago.	None ..	21	7.0	69	3.0	1025
14	George W., 36 ..	Face, arms, legs. Had it two months. No treatment. Subacute.	None ..	21	4.4	71	3.6	1016
15	Arthur N., 16 ..	Axilla and front of chest; slight, but acute. Had it a week. No treatment.	None ..	29	4.9	62	4.1	1076
16	Charles N., 40 ..	Papular eczema, acute; upon scrotum, perineum, flank; and shoulder of one side.	Syphilitic lardaceous disease	26	4.8	65	4.2	1073
17	William B., 22 .	On buttocks and thighs. Moderately bad. Had it one month. Never before. No treatment.	None ..	24	4.0	67	5.0	1057
18	Thomas L., 15 ..	Legs only; moderately bad. Had it six weeks. No treatment.	None ..	31	4.0	59	6.0	1083
19	Fredk. W., 32 ..	Very extensive indeed, all over. Been quiet some months, now acute again on arms, legs and face.	Acute colitis	11	8.4	74	6.6	1000
20	George S., 55 ..	Acute, on legs, arms, body, face. Had it eleven years off and on. Last exacerbation began twelve weeks ago.	None ..	33	10.9	46	10.1	1065

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
21	Walter T., 26 ...	ERYTHEMA: ACUTE, DIFFUSE— Acute attacks daily for last three days. Almost like scarlatina in appearance. Each lasted about an hour. On chest, back, arms, thighs. No itching. Film taken during third attack.	Tachycardia Later, typical Addison's disease developed. See case 3.	34	8.7	53	4.3	1000
22	Eliza W., 22 ...	ERYTHEMA NODOSUM— Several red nodes on each leg. Present four days. Getting better under salicylate of sodium.	Dyspepsia	32	14.6	52	1.4	1020
23	William B., 14 ..	HERPES FACIALIS ET LABIALIS— Very extensive recent patches on upper lip, extending on to both cheeks.	None ...	34	5.5	58	2.5	1047
24	John W., 14 ...	HERPES ZOSTER— Two large patches of vesicles along eleventh dorsal nerve. Present one week. No pus.	None ...	29	6.8	63	1.2	1039

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
HERPES ZOSTER—continued								
25	William R., 41 ..	Broad band of vesicles all along fifth dorsal nerve. No suppuration. Present one week.	None ...	42	14.4	42	1.6	1087
26	Florence M., 24	A few scattered vesicles along seventh dorsal nerve. One purulent. Present five days.	None ...	59	7.0	32	2.0	1084
IMPETIGO—								
27	Mabel M., 7 ...	Bad on face. Slight on hand. Had it two weeks. No treatment.	None ...	45	5.0	50	0.0	1128
28	Marie B., 8 ...	Very extensive on face and scalp. Had it three weeks. No treatment.	None ...	32	8.0	58	2.0	1059
29	Rose C., 9 ...	A dozen pustular blebs on face. Had them "one day." No treatment.	None ...	23	4.7	70	2.3	1069
30	Gertrude T., 12	Extensive on face. Pustules been coming two days. No treatment.	None ...	37	5.4	*55	2.6	1063

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
31	Charles P., 49 ...	<p>LICHEN PLANUS—</p> <p>Arms, legs, abdomen, back. None on face. Had it two months this time; been improving for one month under liquor arsenicalis.</p> <p>Worst from elbows to wrists; a few papules on abdomen and legs. Two scarred patches inside cheeks. Had it off and on five years.</p>	None ...	35	5.4	53	6.6	1097
32	Fredk. C., 28 ...		None ...	31	2.8	66	0.2	1008
33	Robert S., 36 ...	<p>LUPUS ERYTHEMATOSUS—</p> <p>Across nose, and in front of left ear. Had it five years. Stationary.</p> <p>Very widespread; on scalp, face, back, hands, feet. Had it six years, better and worse. Now getting better.</p>	None ...	33	10.3	56	0.7	1000
34	Ellen F., 27 ...		None ...	46	6.4	46	1.6	813

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
		LUPUS VULGARIS—						
35	Edith S., 19 ...	All over right cheek. Had it fourteen years. Is now healing after an exacerbation.	Lymphatic overgrowth of right leg.	37	4.5	57	1.5	1049
36	Elizabeth W., 16	One big scab all over right cheek. Several "apple jelly" patches on left cheek and forehead. Had it thirteen years.	Old amputation of knee for tubercle.	16	6.3	76	1.7	1021
37	Rose H., 13 ...	Ulcer the size of a five shilling piece on right cheek. Had it seven years. Worse last three months.	None ...	45	5.4	47	2.6	1122
		MOLLUSCUM CONTAGIOSUM—						
38	Thomas C., 6 ...	A great many of the wart-like excrescences on the face only. Present one year.	None ...	29	3.8	64	3.2	1047
		PITYRIASIS SICC—						
39	Edwin C., 15 ...	Several large dry scaly red patches on cheeks. Often has them. Present patches a fortnight old. No treatment.	None ...	37	6.9	55	1.1	1000

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
PSORIASIS—								
40	Leopold V., 17 ...	Legs, thighs, elbows; improving. Treatment for two months.	None ...	43	4.7	52	0.3	1047
41	David S., 60 ...	Scalp, knees, elbows; chronic. Had it eighteen months. Irregular treatment.	None ...	39	3.6	57	0.4	1067
42	Alexander C., 28	Thick all over, except head. Excessively bad. Has had it thirteen years, but this is worst; present attack seven months.	Old renal calculus.	23	5.5	71	0.5	1105
43	Lucy J., 40 ...	All limbs, trunk, neck and head. Had it off and on since eighteen. Acute attack. Treatment one week.	Subacute rheumatism	40	6.5	53	0.5	1025
44	Amy N., 7 ...	Body, arms and legs. Had it once before; present attack three weeks, mild. Guttate. No treatment.	None ...	31	5.1	63	0.9	1087
45	Thomas C., 4 ...	All over body, limbs, head. Has had it two months. No treatment.	None ...	34	7.7	57	1.3	1086
46	John D., 28 ...	Simply smothered all over. Had it once before. Has lasted three months this time. Acute. Treatment, but worse.	None ...	34	2.7	62	1.3	1043
47	Ellen R., 70 ...	Very extensive. Never had it till two years ago. Since then off and on. Recent acute exacerbation.	None ...	37	7.4	54	1.6	1079

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular philes.	
		PSORIASIS—continued						
48	Thomas C., 4 ...	Same patient as number 45, after one week's treatment. A little better.	None ...	40	3.1	55	1.9	1106
49	Lily E., 15 ...	Knees, arms, scalp. Subacute. Present some months. Treatment?	None ...	37	4.1	57	1.9	1046
50	Thomas S., 53...	Abdomen, legs, arms; big spots, one inch in diameter. Has had it six years. No treatment.	Granular kidney, failing heart.	51	9.8	37	2.2	1169
51	Margaret C., 14	Extensive on arms and legs. Present six months. Irregular treatment.	None ...	21	5.7	71	2.3	1050
52	Louisa M., 55 ...	Extensive continuous scaly patches on elbows, knees, soles. Had it six years. Ointment only.	None ...	36	9.4	52	2.6	1116
53	Sarah L., 30 ...	Legs and knees; not arms. Not acute. Had it four months. Treatment for two weeks.	None ...	38	6.8	52	3.2	1026
54	Martha R., 56 ...	On both knees and both elbows. Very chronic. Has had it twenty-five years, more or less. No treatment.	Dyspepsia	33	3.0	60	4.0	1165
55	George E., 18 ...	Elbows, arms, hands, knees, thighs. Acute. First attack. No treatment.	None ...	42	6.6	47	4.4	1097
56	Henry W., 40 ...	Arms, legs, trunk and back. Healing again now. Had it for thirty years off and on. No treatment.	Traumatic paresis of arm.	30	4.3	61	4.7	1000

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
PSORIASIS—continued								
57	Fredk. C., 59 ...	All over, more or less. Quite chronic. Had it twenty-nine years. No treatment.	None ...	33	7.5	54	5.5	844
58	Susannah H., 40	Legs worst; bad on arms; slight on trunk. Had it twenty-seven years. Recently acute. Treatment one week.	None ...	31	9.1	54	5.9	1697
59	Elizabeth A., 34	On hands, arms, and neck. Had it many years. No recent acute attack. No treatment lately.	None ...	37	6.4	50	6.6	1061
SCABIES—								
60	Caroline W., 31	Hands and forearms. Not purulent. Noticed it ten days. Extensive burrows.	None ...	27	7.9	65	0.1	1048
61	Florence T., 9 ...	Hands, forearms, feet, ankles. Had it a fortnight. Plentiful. Some purulent.	None ...	16	3.8	80	0.2	1026
62	Henry S., 13 ...	Extensive; on hands, forearms, arms, feet, legs, thighs, abdomen. No pus. Had it one week.	None ...	36	24.6	38	1.4	1014
63	Emily M., 45 ...	Ordinary case. Had it two weeks. No treatment.	None ...	29	3.4	67	1.6	1005

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
64.	Alice G., 3 ...	SCABIES—continued Especially upon feet and ankles. Bad. Had it seven weeks. Many pustules. Extensive on both hands; a few places on forearms and legs. Had it three weeks. No treatment.	Otorrhœa	43	4.0	51	2.0	1054
65	Emily C., 10 ...		None ...	28	4.4	70	6.6	1110
66	Jane L., 36 ...	SCLERODERMIA; AND LEUCOMELANODERMIA— Marked scleroderma of hands, forearms and face. Leuco-melanoderma extensive on arms, abdomen, back and thighs. Present ten years. Electric baths for hands; sodium sulphocarbonate by mouth.	Raynaud's disease.	28	4.8	66	1.2	1000
67	Henry G., 1½ ...	SYPHILIS, CONGENITAL— Rash all over limbs and trunk; very extensive. Present six weeks. Extensive all over everywhere except abdomen. Came out soon after birth.	None ...	82	6.7	11	0.3	1230
68	Ellen A., 1½ ...		None ...	52	5.4	41	1.6	1080

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
SYPHILIS, SECONDARY—								
69	Mary J., 24 ...	All over body. First noticed fourteen days ago. No treatment.	None ...	36	1.1	62	0.9	1089
70	Elizabeth M., 16	Secondary rash all over legs; also rash fading from trunk. Condylomata vulvæ.	A few burrows of scabies.	25	5.9	68	1.1	1061
71	William R., 25..	Secondary rash all over but legs. Present six months. Chancre eighteen months ago. No proper treatment.	None ...	23	8.2	67	1.8	1000
72	John S., 20 ...	Extensive secondary eruptions. Present three months. No continued treatment.	None ...	21	7.5	65	6.5	1125
SYPHILIDES, TERTIARY—								
73	Thomas D., 45..	Very extensive on hands, arms, face, back, and legs. Also psoriasis palmaris on palms and soles. Chancre twenty years ago.	None ...	11	5.0	74	10.0	1087
TINEA TONSURANS—								
74	Kate McG., 11 ..	One patch, size of a florin, in front of ear. Had it some weeks. No treatment.	None ...	30	10.4	59	0.6	1092
75	Ernest C., 6 ...	Large patches covering one-third of head. Said to have been noticed "a fortnight." No treatment.	None ...	28	8.8	62	1.2	1067

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
		TINEA TONSURANS—continued						
76	Albert B., 7 ...	Patches covering one-quarter of scalp. Had it five weeks. Treatment: ointment from chemist.	None ...	49	6.7	43	1.3	1056
77	Alfred B., 5 ...	Four or five patches. Had it two months. No treatment.	None ...	39	5.3	54	1.7	1048
78	Fredk. S., 10 ...	Several patches, from size of sixpence to that of half-a-crown. Scalp only. Had it six weeks.	None ...	36	6.2	56	1.8	1017
79	James R., 7 ...	Extensive. Had it two months. No treatment.	None ...	32	18.1	48	1.9	1017
80	Charles H., 11 ...	Extensive. Had it five weeks. Treated with ointment for three weeks.	None ...	38	10.6	48	3.4	1085
81	Fredk. R., 5 ...	Several very large patches. Had it two and a half months. Treated with ointment, but spreading.	None ...	40	11.5	45	3.5	1161
82	Olive W., 7 ...	Twenty to thirty patches, from size of sixpence to that of one shilling. Had it six weeks. No treatment.	None ...	30	5.5	60	4.5	1053
		TINEA VERSICOLOR—						
83	Edith H., 27 ...	All over chest; some on abdomen. Chronic. Had it many years. No treatment.	Compensated mitral stenosis.	48	6.4	44	1.6	1048

LIST OF CASES—continued.

Case No.	Name and age.	Notes on skin lesion.	Other illness.	Percentage of—				Total leucocytes counted.
				Small lymphocytes.	Large lymphocytes.	Poly-morpho-nucleated.	Coarsely granular eosinophiles.	
		URTICARIA—						
84	James F., 7 ...	All over body. Large wheals seen. Great irritation for twenty-four hours.	None ...	43	3.4	53	0.6	1009
85	Thomas G., 69 ...	Bad urticaria at night. Nothing seen in day-time. Pre-ent one week.	None ...	40	7.8	51	1.2	1000
86	Florence F., 1 ...	Acute papular urticaria all over, especially on limbs.	None ...	59	7.1	32	1.9	1048
87	Charles G., 27 ...	Papular urticaria on and off for six months. Arms, legs, chest and neck badly scratched.	None ...	46	4.4	47	2.6	1035
		VELDT SORES—						
88	Hubert J., 40 ...	Was two years in South Africa. Had veldt sores a long time. Extensive and suppurating, especially on legs and thighs.	None ...	22	6.6	68	2.4	1049
		XANTHOMA DIABETICORUM—						
89	Lewis D., 20 ...	Extensive and typical eruption on face, arms, legs, hands, feet. Had it twelve months ago; it got better, worse again last three months. No treatment.	Diabetes mellitus.	42	3.6	42	12.4	1078
		DIABETES MELLITUS, WITHOUT SKIN LESION—						
90	James L., 45 ...	Known to have had typical diabetes mellitus for more than a year.	None ...	32	8.6	58	1.4	1284

SOME CASES ILLUSTRATING THE INFLUENCE OF HEREDITY IN ANGIO- NEUROTIC ŒDEMA.

BY C. A. ENSOR.

I PROPOSE in these notes to condense a medical family history which appears to me not only interesting in itself, but conclusive as to the hereditary character of a disease which I believe to be Angio-Neurotic Œdema.

I have definite information regarding eighty persons of this family, and of these thirty-three are or have been affected with the disease. Of the thirty-three twelve have died of suffocation, and of the remaining twenty-one some from other causes, whilst most of the surviving members of the family are under observation. Two doubtful cases are not included amongst the deaths.

Sex.—An analysis of the cases in this family shows that males are twice as frequently attacked as females, twenty-two being males and eleven females.

Age.—The disease generally commences in this family about the age of puberty, though in one case, that of Annie, daughter of Edwin, the child was only eight years old when first attacked. The ages of those who have died ranged from 16 years to 70 years. One patient was under 20, three were between 20—30, two between 30—40, and five between 60—70. I have been unable to ascertain the age of the remaining case, but am informed that she was over middle age.

In all the cases regarding which trustworthy information can be obtained, the symptoms and mode of onset are in fairly constant conformity with the description of the disease given in medical text-books.

Painless, frequently irritable, circumscribed swellings appear, with varying degrees of rapidity, on different parts of the body, generally on the arms, hands, legs or face; less often the mouth, tongue, or larynx are involved. It is worthy of note that almost all the affected members are peculiarly liable to severe intestinal colic.

The swellings disappear in some instances in from eight to twelve hours, though more frequently cedema is apparent for a much longer period, sometimes, I am told, for so long as forty-eight hours after the onset.

In the three following fatal cases I have seen the symptoms were almost identical, with the exception that in one of them there was much cedema of the face.

1.—Ezekiel L., æt. 66, was liable to sudden swelling in the throat and about the body. On October 16th, 1895, he was returning home from his work and at 3.50 p.m. was seen by a shepherd who spoke to him, and he then seemed in his usual health. At 4.5 p.m. he was found lying dead by the side of the road on the down a short distance from the spot where he stopped to speak to the shepherd. When I saw the body half an hour later it was lying prone, the hands clenched, and the face and visible mucous membranes were of a purplish colour. The tongue was not swollen. I was unable to obtain permission to make a post-mortem examination.

2.—Henry D., æt. 24, great nephew to Ezekiel L., had suffered from several attacks of cedema. On October 16th, 1895, he was sitting at his supper when he heard of his uncle's death. When told the cause he was much agitated and expressed the belief that he himself would die in the same way. He seemed a good deal upset at the suddenness of his uncle's end and spoke of it several times. Early on October 18th, 1895, I was called to him, and on arrival found him dead. He had been suddenly attacked with dyspnœa and was dead in a few minutes. His mother told me

that he had been several times threatened with suffocation. He would never go to sleep if his face was œdematous for fear it might spread to his throat.

3.—Sarah L., æt. 41, a niece of Ezekiel L., had since her girlhood been liable to attacks of localised œdema. On June 29th, 1891, whilst occupied with her household duties, her face became swollen. This was in the early afternoon, but, as she had previously been affected in the same way and recovered without the development of alarming symptoms, did not think much of it. As the œdema increased she went to her sister's house where she had tea. After tea she went upstairs and a few minutes later called out that "it was going to her throat and she was sure it would choke her." The face was then more swollen and the eyes were closed from the swelling. She was taken downstairs and the breathing rapidly became more laboured. She died suffocated a few minutes afterwards.

4.—The following case, that of Emily L., æt. 13, daughter of Henry L., suggests that the disease might attack lung tissue itself. She died cyanosed twelve hours after the onset of acute lung symptoms. I was called to see her on October 10th, 1895. A short time previously she complained of shortness of breath and became rapidly worse. The physical signs were those of acute bronchitis and there was moderate pyrexia. I could not determine whether any portions of the lungs were solid. The gravity of her condition increased, and she died the same evening. I gave a certificate ascribing death to acute capillary bronchitis, but it may fairly be asked if the condition might not have been one of angeio-neurotic œdema of the lungs sufficiently extensive to produce suffocation. The child had previously had attacks of localised œdema.

The following are the non-fatal cases I have seen :—

1a.—Eliza D., æt. 53, mother of Henry D., sent for me on October 21st, 1903, the messenger saying that she was suffocating. I found her sitting in an arm chair in some distress but apparently better than she had been. She could speak with difficulty. Her breathing was laboured but did not sound like that of laryngeal obstruction. The tongue was greatly swollen

and watery looking and protruded between the teeth. I was informed that "it had been bigger but was going back now." The condition subsided in a few hours and when I saw her next day the tongue was normal in size. In this instance the tongue alone was affected. On November 7th, 1903, I called to make some further enquires regarding her family peculiarity and she was then recovering from another attack which had affected the left side of the face and temporal region. There was still some œdema over the malar bones, and puffiness of the eyelids. This condition had lasted about thirty hours.

2a.—Henry L., æt. 50, father of Emily L., has frequently had swelling in the throat and about the body. I attended him in March, 1897, for severe intestinal colic. There was no œdema externally. The pain was so severe as to require opium for its relief. He tells me that he has had many attacks of colic since, but never so severe as to need treatment. He has many times had swellings in the throat and on three occasions has been threatened with suffocation. The last of these occurred whilst he was under treatment in Salisbury Infirmary for another condition in 1897. The treatment adopted was ice poulticing which was kept up for twelve hours, after which the œdema subsided.

I have obtained the subjoined information regarding the following cases, either from the patients themselves or their near relatives, and I have no reason to doubt the accuracy of what they have told me:—

1b.—Luke L., æt. 70, was the first member of the family to be affected so far as is known. He was liable to swellings on various parts of the body, and was found lying dead on the floor in his house in 1843.

2b.—William L., æt. 70, was often attacked with the disease but did not die of it. His nephew, Edwin, tells me that he usually had attacks of intestinal colic every ten days. They began with pain in the abdomen and were always followed by vomiting. Independently, he would get the characteristic swellings about his body. These attacks of colic lasted, as a rule, about twelve hours.

3b.—Lot L., æt. 61, died May 7th, 1856, of an acute abdominal disease. He was taken suddenly ill with pain in the stomach and vomiting and died in twenty hours. His son tells me that the doctor said death was due to inflammation of the stomach. This man, like his brother, suffered much from colic, which was also periodical and came on every nine days, in addition he was frequently attacked with localised oedema.

4b.—Edwin L., æt. 68, son of Lot, tells me that he used to suffer severely, but for the last three or four years has been comparatively free. The hands and feet are most often affected now, but earlier in life he was very subject to abdominal pain and vomiting. These would last twelve to twenty-four hours. He has had many attacks of swelling in throat and mouth. On one occasion, ten or twelve years ago, he “made up his mind that he was going to choke.”

5b.—Richard L., æt. 22, used to have swelling in throat. He enlisted in the Grenadier Guards and died May 2nd, 1853, during an attack. This man was brother to Edwin.

6b.—Annie L., æt. 16, daughter of Edwin. Had many attacks, the first when eight years old. During the evening of April 15th, 1883, one of her hands became swollen. She went to bed and slept, but woke in the early morning as she felt she was choking. The difficulty in breathing increased, and she died suffocated one and a half hours later. Her father tells me that the features looked quite natural after death.

7b.—William L., æt. 66, had an attack of oedema of hands on May 24th, 1892. It began in the early morning, but he went to his work as usual and did not pay much attention to it. He returned home about mid-day as his throat was becoming affected. A doctor was sent for, but he died of suffocation at 1.45 p.m., before help had arrived. His daughter Sarah tells me that the doctor said his life could have been saved by tracheotomy had he been seen early enough. This patient was very liable to colic and had often been affected with swellings about the face and hands. His daughter says she has frequently seen his face so swollen that he could not see. She herself is free and has nine children, none of whom suffer from the disease.

8b.—James L., æt. 60, died at Hereford on January 22nd, 1901, of œdema of larynx. I have no details regarding his illness beyond the fact that his sister, Elizabeth D., received a letter the following day saying that he had been taken ill with swelling in the throat and had been suffocated.

9b.—Thomas L., æt. 38, brother of James L., was also subject to œdema. He was walking home from his work in March, 1885, and was found sitting by the roadside gasping for breath. He was able to say that his throat was swelling, and a few minutes afterwards died.

10b.—Henry L., æt. 64, father of Elizabeth D., was affected but did not die of the disease. His daughter says that he had many attacks in the throat and on the hands, face and about the body. He suffered from colic. On one occasion in 1883 he was asleep in bed when he was threatened with suffocation. He sprang up and had to be restrained from rushing out of the house. The attack lasted for about three minutes before he was able to get his breath again.

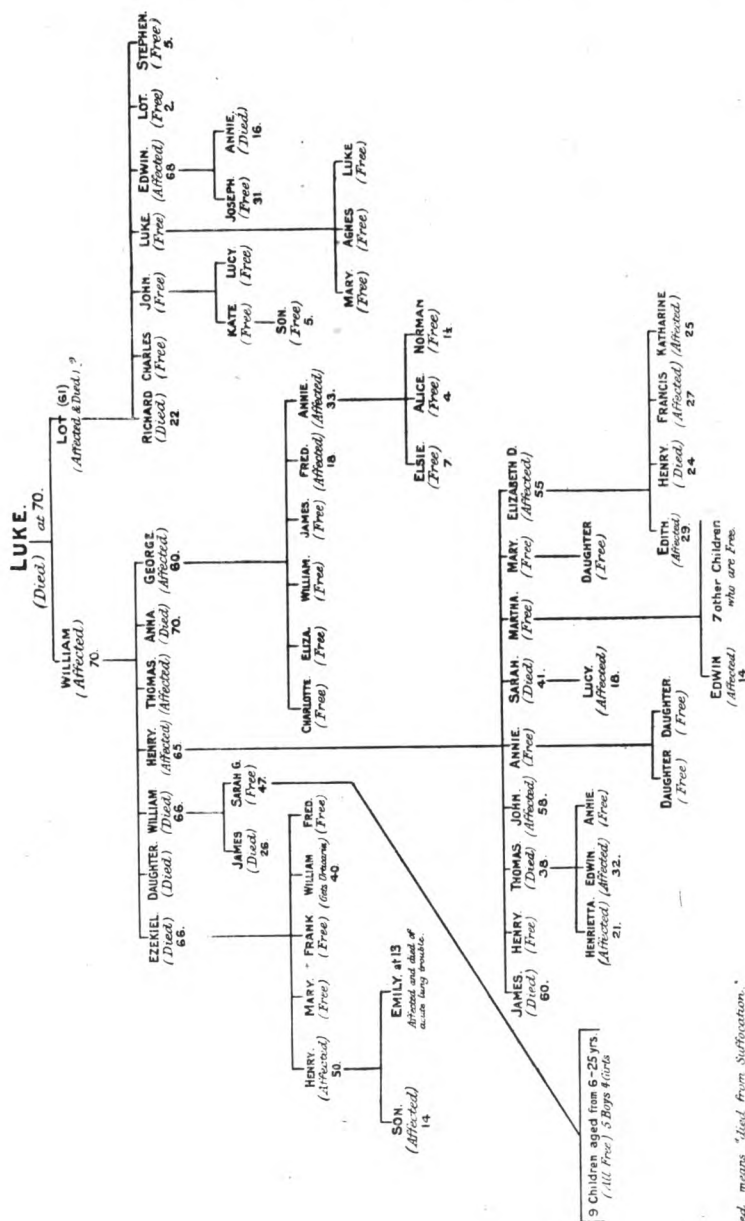
11b.—Elizabeth D., æt. 55, daughter of the last-named patient, tells me she has been liable to the disease so long as she can remember. She thinks her mouth or throat must have been swollen fifteen or twenty times. She does not always feel as though she would choke. When her throat is affected she says there is generally œdema of the neck as well.

12b.—Francis D., æt. 27, daughter of Elizabeth D., suffers from swelling of the hands, and has had three attacks in the throat.

13b.—Edith D., æt. 29, and 14b., Katharine D., æt. 25, are both affected but have never been threatened with suffocation.

15b.—Lucy L., æt. 18, daughter of Sarah L., had her first attack in her hands in November, 1899. Since then she has three times been affected, once her hand became swollen, and twice the face was œdematous.

16b.—James L., æt. 26, brother of Sarah G., died of suffocation on October 16th, 1883. He had several times been affected with œdema of the hands, but the throat had never been swollen before his fatal attack.



Died means 'died from Suffocation.'

The cases may be divided into four groups—

1. In which the subcutaneous tissue alone is affected.
2. In which the mucous lining of the air and alimentary passages are primarily involved.
3. A combined form in which the œdema commences on the face and spreads thence to the buccal and laryngeal mucous membranes.
4. A condition in which intestinal colic is present without any external sign of œdema.

Groups 1 and 4 are the commonest and least dangerous forms of the disease, and the patients do not usually pay much attention to it when so affected, so that opportunities for watching the development of the attacks are rare; it is only when suffocation threatens that they send for medical help and then generally too late for assistance to be of any avail.

In group 2, the onset is more often quite sudden, and unless the swelling quickly subsides death ensues in a few minutes. Cases 1, 2, 1b, 6b, 7b, 9b and 16b, are examples of this form of the disease.

In group 3, the condition commences more gradually, and suffocation does not take place unless the œdema spreads to the larynx. Elizabeth D., No. 11b, may be taken as a non-fatal example of this condition; and Sarah L., No. 3, as a fatal instance.

The cases suggest several interesting considerations:—

1. *Medical*.—In a condition so rapidly fatal as sudden œdema of the larynx has proved to be, the question of treatment both preventive and immediate is of importance, for it can only be by chance that medical aid can be at hand in time to perform the necessary tracheotomy. My father, who had seen many of the cases, used to treat them with drachm doses of tinctura ferri perchloridi, repeated if necessary every twenty minutes, and he has told me that this has, in several instances, seemed of value. Elizabeth D., No. 11b, tells me she was under his care during an attack of threatened suffocation, and thinks that the drug saved her life. She described its effect as “cutting a way for

the air." The forms of treatment adopted by the patients themselves are as varied as they are curious :—Edwin L., No. 4b, says he used regularly to take a tablespoonful of sulphur every week and that this seemed to lessen the frequency and severity of his attacks. When his mouth was swollen he says that "the rough medicine did him good." It was my father's practice to keep those who were liable supplied with the iron mixture in case of emergency. Henry L., No. 2a, tells me that when his throat or mouth begins to swell he keeps sucking pieces of salt butter which relieves him. He does not think that the iron mixture has much effect. His daughter informs me that Henry L., No. 10b, when attacked in the throat would always keep walking about in the open air, for he could breathe more easily whilst "on the move."

2. *Social.*—From a social standpoint the question as to whether persons liable to angeio-neurotic œdema should marry, is not unimportant. So far as the history of this particular family may be taken as a guide, it certainly indicates that they should not. Many of the survivors of the present generation are either childless or too young to marry. Probably, however, some of them will in due course transmit their unfortunate tendency to their offspring, who will be, as their predecessors have been, the inheritors of a legacy which will very likely be fatal to them sooner or later.

3. Another question arises in connection with Life Insurance. What should be the medical examiner's recommendation to an Insurance Company when reporting on the life of a person known either to be affected with angeio-neurotic œdema or to belong to a family in which the disease has appeared?

The history of this family shows that the disease has already killed practically 35 per cent. of those affected and, if these figures are of any value, they indicate that the lives are uninsurable or should be so heavily loaded as to make it improbable that the insurance would be completed.

4. *Medico Legal.*—In the case of persons found dead the point might be raised whether death resulted from foul play.

5. *Conclusion.*—These cases, although too few in number to allow safe conclusions to be drawn from them, seem to indicate :—

1. That the disease is commoner in males than in females.
 2. That it occurs at all ages, but seldom before puberty.
 3. That the tendency to recurrence remains throughout life.
 4. That when the larynx is affected the condition is a very fatal one.
 5. That members of an affected family who themselves escape are less liable to transmit the disease to their children than those who are affected.
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MALIGNANT DISEASE OF THE STOMACH

1826—1900.

BY SIR COOPER PERRY, M.D.

AND

LAURISTON E. SHAW, M.D.

It is not unlikely that in the next few years the surgical treatment of Malignant Disease of the Stomach will be much more frequently adopted than it has been hitherto. Even if the discovery of the cause of cancer should introduce other hopeful methods of treatment in competition with the surgeon's knife, it is probable that at some stages of the disease surgery will still afford the best chance of complete recovery or of at least the speedy relief of certain symptoms. The efficacy of any form of treatment, whether curative or palliative, of any disease can alone be demonstrated by a careful comparison of numerous cases submitted to the treatment in question with others similar in character, and which have not been so submitted. The present paper may prove useful as forming a basis for such comparisons in order to test the value of surgical or other treatment in cancer of the stomach. It has not, however, been prepared with any such special purpose in view. It is merely an attempt to make more accessible to the profession at large some of the treasures hidden in the pathological records of Guy's Hospital. The medical press has frequently in recent years, when reviewing successive volumes of these Reports, regretted the absence from them of the statistical tables and

analyses of interesting cases, which form so large a portion of the reports of other hospitals. No doubt such information has its value, but we are inclined to agree with our editors that the space at their disposal can be more profitably employed. We feel, however, some diffidence in taking advantage of the present editors' generosity in giving so much space to the abstracts of our 306 cases. We are conscious that the space occupied by these abstracts is out of proportion to the value of the deductions we have been able to draw from our study of the cases. We can but hope that the placing side by side of the records of so many cases may enable others to elucidate such points in the natural history of this disease as may occur to them as being worthy of investigation. With this object in view, we have printed an index to the abstract of cases which was in the first instance prepared by one of us for the purpose of our personal study. Prepared for this special purpose the index is not complete, for at the outset we determined to exclude from consideration in this paper certain points in the life-history of malignant disease of the stomach which we had already dealt with in detail in a former communication to these Reports.* Thus, in the index, as in our paper, there is practically no reference to the histology of gastric growths or to the localisation and naked-eye appearances of the disease in the stomach itself, although these points are often touched upon in the abstracts of cases. To these points we have referred in dealing with a smaller number of cases in which we had the advantage of personally inspecting the affected stomachs and of examining microscopical sections of the growths cut under our own direction.

For the benefit of those unfamiliar with the methods of keeping records at Guy's Hospital we ought to give some information as to the source and trustworthiness of the material from which we have obtained our facts and figures. We have restricted our researches to the Records of Inspections or the Post-mortem Reports, as the volumes preserved in the museum are usually called by those working at Guy's. These records go back

* An examination of 50 cases of Malignant Disease of the Stomach. Vol. xlviii., p. 137.

to the year 1826, and from that year until the year 1853 comprise reports of all the more interesting post-mortem examinations made on patients dying in the hospital, as well as of a few post-mortem examinations made by members of the Staff on private patients outside the hospital. These earlier records consist of fair copies made by a clerk or museum attendant from manuscript notes furnished by the pathologist who made the examination, and only in some instances is the name of the individual responsible for the observations recorded, though there is pretty frequent mention of the presence at the autopsies of such acute observers as Bright, Addison, or Hodgkin. From 1854 onwards till the end of the century the method of keeping records of post-mortem examinations has been practically the same as that at present adopted. With very few exceptions an examination has been made of the body of every patient dying in the hospital. In the great majority of cases the examinations have been made and the reports written out on special forms by the appointed pathologists of the hospital. The reports, which are bound in yearly volumes, are either in the handwriting of the pathologist, or are typewritten and signed by him, so that the personality of the individual responsible for the observations can usually be ascertained. The bulk of the facts which we have abstracted in the appendix are the result of observations by Wilks, Moxon, Fagge, Goodhart, Mahomed, Carrington, Pitt, Perry, Bryant, and Fawcett. While this is true of the conditions observed at the post-mortem examination, the observations of symptoms and the incidents in the previous history of the cases do not rest on such high authority. A brief abstract of the original clinical report compiled by a ward clerk, under the control of the registrar, is made by a senior student, and this is copied or condensed by the pathologist at the head of the post-mortem record. Economy of time has compelled us to make use of these condensed reports of clinical histories rather than to refer to the fuller original ward reports, which are preserved in the registrars' rooms.

We are conscious of the incompleteness of the observations here recorded compared with those to be found in full reports

of a small series of cases carefully prepared with a view to publication. But when seeking the life-history of a disease there are certain advantages in dealing with the results recorded by a number of skilled observers unbiassed by any desire to prove or disprove any particular theory. There are also advantages in employing as the basis of one's deductions a large number of cases occurring in the ordinary course of practice at a single institution rather than in using an even larger number of published cases, which from the mere fact of their publication are probably in some of their features unusual examples of the disease.

NUMBER OF CASES.

The number of cases of which abstracts are here published is 306. The whole number is practically available for dealing with the pathological features to which we propose to pay attention, since, as already stated, questions of histology and some other details in which many of the reports are deficient, are not touched upon in this communication. On the clinical side the reports vary a good deal in their completeness, and we have been obliged, therefore, to make selections from the whole number of cases when dealing with symptoms, physical signs, and points in previous history.

During the period in which these 306 fatal cases of cancer of the stomach have been examined in the post-mortem room at Guy's Hospital, the total number of autopsies made was 21,260. It will be observed that this gives a proportion of about fourteen cases of malignant disease of the stomach in every thousand cases dying of all diseases in a large general hospital. This is a striking contrast to the proportion of fatal cases of malignant disease of the duodenum, which from the same source we have estimated to be only 1 in 1,800.

SEX AND AGE.

The age given in each report is the age of the patient at the date of admission to the hospital. As the average period which elapsed between admission to the hospital and death is only six weeks we may regard the age given as equivalent to the age at death.

In 283 of the cases both the age and sex are recorded. The following table shows the incidence of death in the various decades for all the cases taken together as well as for the sexes separately.

Age at death.	Number of cases.		
	Males.	Females.	Both Sexes.
11—20	2	1	3
21—30	3	4	7
31—40	18	16	34
41—50	76	26	102
51—60	60	23	83
61—70	39	5	44
71—80	6	3	9
81—90	0	1	1
Totals ...	204	79	283

From this table it will be seen that considerably more than half the cases died between 40 and 60 years of age, and that rather more than one-third of the cases died between 40 and 50. The greater frequency of deaths in these two decades is noticed alike in males and females. On the other hand, of the cases which did not die in these two decades, more than half the remaining women (sixteen out of thirty) died between 30 and 40 years of age, and more than half the remaining men (thirty-nine out of sixty-eight) died between 60 and 70. In other words, 40 to 70 are the most fatal years for men and 30 to 60 for women.

From a table showing the incidence of death for each year of age for both sexes, which is not here reproduced, the following facts are taken. The youngest male was 15, the youngest female 18, the oldest male was 71, the oldest female 81. Eighteen patients died in their 45th year, thirteen being males and five females. This is the largest number of cases at any one age for either sex.

For comparing the frequency of the disease in the two sexes irrespective of age, three hundred cases are available, two hundred

and eighteen of these are males and eighty-two females. Roughly, this gives a proportion of five males to two females. This appears to be a somewhat greater disproportion between the two sexes than has been found in other series of cases. It is well to bear in mind that in all the cases at present under review the existence of malignant disease of the stomach was determined by post-mortem examination.

DURATION OF ILLNESS.

It is obvious that the actual duration of a case of malignant disease of the stomach cannot be accurately determined. A perusal of our cases would prove, if proof were necessary, that a gastric growth may exist for a considerable time without producing any recognisable symptoms. There is, however, ample material in the accompanying reports for determining the average length of the interval between the death of the patient from cancer of the stomach and the onset of the first symptom of disease. In individual cases there may be room for doubt whether the earliest symptoms are necessarily due to the fatal disease, but considering the large number of cases dealt with this source of error may be neglected.

For the purpose of determining the duration of the illness in this series of cases we have prepared two tables, one showing the number of days each patient spent in the hospital before death, and the other the number of months each patient had complained of ill-health before admission: 276 cases are available for the former calculation, and 172 for the latter. The average length of stay in the hospital was 43·5 days, or roughly one and a half months. One case died on the day of admission, and one lived 280 days in the hospital. From the 172 cases in which the length of illness antecedent to admission is recorded, we have excluded six cases in which the duration is stated to have been over two years. Apart from the doubt which naturally arises as to whether such prolonged illness was indeed due to the disease in question, the cases are obviously so unusual as to vitiate an attempt to arrive at an average duration for practical purposes. If these cases are excluded the table as here set out shows that the great

majority of the cases were ill under six months before admission, and that there is a steadily diminishing number for each period greater than six months up to two years.

Duration of symptoms before admission.	Number of Cases.
1 month	16
2 months	20
3 "	20
4 "	17
5 "	11
6 "	19
7 "	6
8 "	6
9 "	5
10 "	8
12 "	14
15 "	3
18 "	8
24 "	11

The average duration of antecedent illness before admission works out at seven and a quarter months, and if to this be added, one and a half months, the average stay in the hospital, the average interval between the onset of symptoms and death in this series of cases is eight and three-quarter months. If the six doubtful cases of exceptional length be included, the average duration of illness is increased from eight and three-quarter months to ten months.

Cases of unusual length of illness.—The six cases which have been separately dealt with in the statistical tables on account of the long period that elapsed between the earliest symptoms of disease and admission to the hospital, are perhaps worthy of more detailed consideration. In three of them profuse hæmatemesis was a prominent early symptom, occurring five years, two and a-half years, and two years respectively, before admission. In two cases, Nos. 153 and 251, the early hæmatemesis was associated with melæna, and in the other, No. 139, the most prolonged of all our cases, it is stated that the patient brought

up congealed blood five years before admission, and had continued to vomit daily ever since.

The question naturally arises whether in these cases of early hæmatemesis there had been a simple gastric ulcer, in connection with which or independently of which malignant disease had subsequently arisen. To the supposed relation of simple to malignant ulceration we shall refer again: for the present it may be noted that in these three prolonged cases a simple ulcer of the stomach, independent of the growth, is described in one of the reports (No. 139). In another (No. 153) Dr. Goodhart states that the disease was too far advanced to allow any conclusion to be drawn as to its origin, and in the third Dr. Bryant makes no reference to this point, but expresses the opinion that the gastro-jejunosomy which had been performed was probably responsible for prolonging the patient's life nine months. If this supposition of Dr. Bryant's is true the case, if not operated upon, would have escaped inclusion in our list of instances of unusual length of illness.

In the report of a patient under Dr. Addison, in 1857, who was stated to have suffered from gastric symptoms for three years before admission (No. 39), there are some points which render the existence of malignant disease very doubtful. The case was one of pyloric obstruction with great dilatation of the stomach. The patient, a woman, was only twenty-two years of age at death, and was the subject of acute phthisis. From the microscopical examination of the tissue infiltrating the pylorus it was thought probable that the disease was sarcomatous in nature. But the long history and the absence of any secondary deposit incline us to doubt whether the affection was malignant at all. Two cases remain in which a history of four years' illness before admission was obtained. In one (No. 252) it is stated "for the last four years the patient has suffered from indigestion, gradually becoming worse." In this case gastro-jejunosomy was performed, but the prolongation of life cannot be attributed to the operation, for the patient died collapsed the following day. The pathologist reports, "No evidence of old simple ulcer," but in long standing cases it is

obvious that the appearances of a simple ulcer might be entirely transformed by malignant infiltration. In favour of the view that this neoplasm may have been developing in the stomach during the four years in which symptoms were present are the slow-growing character and feeble powers of dissemination of the carcinoma. In the liver, which was the only site of secondary growth, it is reported that "there were numerous secondary deposits, most of them *umbilicated* and *very hard* on section." It is also reported that "microscopically the growth was a spheroidal carcinoma with *abundant stroma*." The last case (No. 268) is somewhat similar. It is that of a woman, *æt.* 36, who had "suffered from abdominal pain, with vomiting after meals, for the last four years." This case, as well as the succeeding one, is open to the interpretation that in the earlier period of the illness the symptoms were due to dyspepsia from some cause other than malignant disease. For however little evidence there may be that chronic dyspepsia renders a patient more liable to carcinoma of the stomach, one can hardly believe that chronic dyspepsia would ward off cancer. The accidental development of malignant disease of the stomach in a chronic dyspeptic is an event one would certainly expect to observe now and then in any large collection of cases. While bearing this possible explanation of unduly prolonged cases in mind, it will be seen that there are special features in the post-mortem appearances of this last case that make it not improbable that the pain and vomiting were due throughout to malignant disease. For example, Dr. Pitt, who made the examination, says, "Upon laying open the stomach a most remarkable condition presented itself. . . . I do not remember to have seen such extensive sloughing of a growth, and the extent of surface involved is unusual." This unusual extent of a growth, which failed to implant secondary deposits in any tissue except two or three small nodules in the left lobe of the liver, is perhaps an indication of the long time during which the gradual infiltration of the organ had been in progress.

In considering this question of great prolongation of life in cases of cancer of the stomach, it must be borne in mind that death in this

disease is usually due to some local accident, such as obstruction, perforation, or hæmorrhage, unless it is the result of malignant cachexia or of secondary deposits. In a patient who is resistant to the poisonous effects, or to the dissemination, of malignant growth the disease might well be unduly prolonged, should he escape the local accidents which depend upon the position or direction of the growth.

There are no cases in our series which have struck us as instances of the unusual prolongation of disease due to an arrest or retrogression of the malignant growth, an event to which so much attention has been drawn lately as a result of experience gained by exploratory operations. We refer to recorded cases in which after laparotomy, with or without any therapeutic operation such as gastro-jejunostomy, a mass apparently malignant has disappeared concurrently with temporary restoration to health. Perhaps such masses are generally only of inflammatory origin, and our failure to find instances of such retrogression without operation is due to the fact that we are dealing only with fatal cases of cancer verified by post-mortem examination.

ETIOLOGY.

Our cases taken by themselves are not likely to throw any light on the mystery of the cause of cancer. They may be of use, however, in the compilation of statistics which are to form one of the departments of cancer research. While little light is thrown on the cause of cancer generally, not much more we fear is thrown on the reason for the selection of the stomach as the seat of primary invasion. It is perhaps rather the result of preconceived notions of pathology than of direct observation that injury, chronic dyspepsia, alcoholism and simple ulceration of the stomach have come to be regarded by some as playing a part in the causation of gastric cancer. Certainly a consideration of our cases does not add much to the weight of probability that any of these conditions are causal factors with perhaps the single exception of simple gastric ulcer. Traumatism as a feature in the history of the case seems hardly to have attracted the attention of any of our reporters. Such common conditions

as alcoholism and chronic dyspepsia are of course pretty frequently recorded. The cases in which these two antecedent conditions are noted are included in the index under the headings "alcoholism" and "previous chronic dyspepsia." There are only eighteen entries under the former heading and fifteen under the latter, and when one considers the commonness of the two conditions amongst hospital patients generally, these numbers tend to strengthen our belief that neither condition renders a man more likely to become the subject of growth of the stomach. In whatever manner increasing knowledge of the origin of cancer may modify our views on these points, we feel that the majority of physicians at the present time will agree that in a doubtful gastric case the existence of a history of prolonged chronic dyspepsia should count against rather than in favour of a diagnosis of malignant disease. Alcoholism, as providing a cause for dyspepsia, would probably be regarded in the same light. It is the insidious apparently idiopathic dyspepsia coming on in middle age which causes the physician so much anxiety as to its possible neoplastic origin. Following the same line of argument the known existence of a simple gastric ulcer would lessen our fears of cancer in a case which began to exhibit suspicious signs. Whether we should be justified or not in taking this view is a question upon which some light may be thrown by considering the present cases. Twelve cases are indexed under the heading "Stomach, simple ulcer of," to indicate that in the reports mentioned reference will be found to the existence of a simple ulcer or to the supposed association between simple ulcer and malignant disease. It is interesting to note that ten of these cases occur in the last one hundred reports, thus showing the greater attention that has been paid to this point in more recent years. Until this question was definitely raised it was but natural that an ulcer, whether in the midst of or close to a mass of malignant deposit, should be regarded as a resulting rather than an antecedent condition.

That notwithstanding the difficulties of recognising simple ulcers in the midst of malignant infiltration various pathologists called attention to their presence in nine out of one hundred and three cases, does indeed suggest that the relation of the two

lesions is something more than accidental. In a special investigation made to determine the frequency of simple gastric ulcer in a series of post-mortem examinations Welch found that 5 per cent. of all bodies presented simple ulcers, healed or open. In the last hundred cases in our present series 9 per cent. presented what were regarded by the pathologist as simple ulcers in association with malignant disease. The fact that simple gastric ulcer is generally associated with hyperchlorhydria, whereas in cancer the free hydrochloric acid in the gastric juice is diminished, makes it unlikely that malignant disease should predispose to the formation of the simple peptic ulcer. So far, then, as so small a number of cases can lend weight to any view, a consideration of these favours the belief that simple ulcer predisposes to cancer. It at least would seem to negative a view attributed to Trousseau that the two diseases are antagonistic. The question is perhaps of sufficient interest to justify a closer analysis of the cases bearing upon it. Ten out of the twelve cases in which the relation between ulcer and cancer is discussed occurred in or after 1888, that is two years later than the publication of the first edition of Fagge's *Medicine*, in which the following passage occurs: "I believe that I have myself seen more than one case in which the stomach presented part of the circumference of a simple ulcer, the rest of which had been replaced by a malignant growth. If this is correct, the occurrence is probably more frequent than might appear from the absence of direct observation of it; for in many cases the extensive development of cancer would doubtless obliterate all traces of the previous ulcer." It is not difficult to believe that the attention thus drawn to this point by one whose teaching was so valued at Guy's is in some measure responsible for the increasing number of direct observations in recent years. In only two of the twelve cases do there appear to have been any clinical signs pointing to the pre-existence of a simple ulcer. In one case (No. 238) it is stated in the report that one of the writers of this paper hazarded the suggestion in the ward that a simple ulcer had been the starting point of cancer, on the ground that there was a history of profuse hæmatemesis and

melæna eight years before death. The pathologist does not, however, seem to have observed in the post-mortem room any special features confirming this view. In the other case (No. 304) the following extract from the report shows that the long duration of the symptoms, as well as the post-mortem appearances, make the pre-existence of a simple ulcer probable "He (a man aged 43) has always been subject to pains in the abdomen. During the last five years the pain has been more acute and he has vomited a good deal. Never vomited any blood or passed any in motions. A large ulcer measuring 6.35 by 3.75 centimetres was seen, on opening the stomach, just above the pylorus on the posterior wall at the lesser curvature. The edges were thickened and everted, and the floor was firm and fibroid. In the region of the ulcer there was a good deal of thickening of the stomach walls, which on section looked very much like new growth. Microscopical examination of the ulcer showed a large amount of fibrous tissue, which in places was infiltrated with groups and tubules of columnar cells. 'It was evident,' says Dr. Bryant, 'that a chronic ulcer had become malignant.'"

In the remaining cases the evidence is entirely pathological. In four cases (Nos. 139, 190, 209, 297) there are no features indicating that the simple ulcer was the starting point of the cancer. All that is pointed out is that the two conditions co-exist. In one case, indeed (No. 139), it does not appear that the ulcer was situated in a part of the stomach involved in growth. It should be noted, however, that this is the case referred to above as an instance of unusual length of symptoms in which hæmatemesis occurred five years before admission. The following extracts indicate the conditions found in the rest of the cases and the views held by the pathologists who investigated them.

No. 203, a female, æt. 45. —On the upper surface, along the lower curvature one and a-half inches from the pylorus, was a chronic ulcer one inch by three-quarter inch in diameter, and not above one-sixteenth inch deep. The edges were not fungating nor raised, and were not spreading. The floor of the ulcer was formed by the mass of growth in the gastro-hepatic omentum. Dr. Pitt says, "I conclude from the microscopical and other appearances that the growth had commenced on the floor of a gastric ulcer."

No. 207, a female, æt. 65.—There was a thickening of the pyloric extremity of the stomach commencing at the pylorus and extending for about one and a-half inches. The mucous surface was thickened and white. In the middle of this thickened area was a deep narrow ulcer, with chronic edges, not at all like ulcerating growth. This was apparently a chronic gastric ulcer which had become malignant, for the thickening of the mucous membrane is of that nature. Mr. Targett's microscopical examination of the growth is as follows:—The base of the ulcer showed much fibrous tissue mixed with muscular coat, and running among it were lines and groups of small spherical cells which were evidently cancerous. The edge showed the mucous membrane raised by growth in the submucous tissue, and there were even small alveoli of epithelial cells among the gastric tubules just above the muscularis mucosæ. The enlarged glands along the lesser curvature showed that the growth was a scirrhus carcinoma. In the description of the naked-eye specimen the appearance suggested a chronic ulcer becoming malignant from its well-defined outline, hard edge and smooth, clean, hard base. "I examined," says Mr. Targett, "A great number of sections in order to test this point, but the conclusion arrived at was that it could not be settled by mere histological examination in the absence of clinical evidence of bygone gastric ulcer. The points supporting the view are the immense amount of fibrous tissues as compared with epithelial cells in the base of the ulcer, and its smooth, clean, surface, quite unlike ulcerated growths."

No. 240, a female, æt. 29.—The stomach was examined and the pyloric end was infiltrated with a hard, thick, scirrhus-like growth which was thickest just above the pyloric ring. It appeared to involve the body of the organ up to about three and a half inches from the pyloric ring. On the posterior surface just below the lesser curvature was the cicatrix of an old ulcer about the size of a shilling, hard and thickened, "and this," says Dr. Bryant, "was probably the starting point of the growth."

No. 243, a male, æt. 64.—A saddle-shaped ulcer extended along the anterior wall along the lesser curvature, and on the posterior wall as far as the greater curvature. On the floor of the ulcer could be seen the ends of a number of vessels in some of which was recent thrombus. The edges of the ulcer were thick, soft, white and cancerous and there were little nodules of growth in the surrounding mucous membrane. "I think," says Dr. Perry, "this is a very good example, as far as could be judged by post-mortem appearances, of an ulcer becoming carcinomatous; but, on the other hand, there was no history of long-continued indigestion nor of hæmatemesis. Therefore on the clinical side the evidence is inconclusive."

No. 295, a male, æt. 38.—On opening the stomach the pylorus was found to be very tightly constricted by what appeared to be fibrous tissue. Three centimetres above the pyloric ring on the lesser curvature was a large chronic ulcer measuring seven by three centimetres. The floor of it was smooth and formed of fibrous muscular tissue; the edges much thickened and slightly inverted. Around the ulcer the stomach wall felt very hard and indurated as if infiltrated with growth. "I came," says Dr. Bryant, "to the conclusion from the microscopic appearance of the pylorus and the ulcer that it was a chronic ulcer becoming malignant."

No. 305, a male, æt. 61.—The stomach appeared considerably dilated, and the coats were somewhat thin. Close to the pyloric orifice, and situated on

the lesser curvature, was an irregular, nodulated, circular growth, the size of a half-crown piece. The centre of the growth was much depressed, and appeared as if it had been scooped out. The floor was smooth. The nodular mass around the edge of the ulcer consisted of a soft, white growth, with hæmorrhages into the substance. "From the naked-eye appearance of the ulcer, and its scooped-out character, and its smooth floor, I thought," says Dr. Fawcett, "it was an example of a simple ulcer which had become malignant."

THE RESULTS, IMMEDIATE AND REMOTE, OF MALIGNANT DISEASE OF THE STOMACH RECOGNISABLE DURING LIFE.

The list of symptoms and physical signs mentioned in the abstracts of cases and reasonably to be regarded as the direct result of malignant disease of the stomach is a long one. Some symptoms are noted as occurring in nearly half the cases, others are to be found only once in the entire series. To deal intelligibly with so large a number of symptoms it is desirable to make some sort of classification. The classification here set out is necessarily merely tentative, since it is based on etiology, and we have been obliged to assume a knowledge of the cause of certain symptoms which are at present unexplained or are due to more than one cause. Nevertheless we believe this division of symptoms will prove convenient, for it will enable us to discuss a good deal of our pathological material from the clinical side, a method which we hope will render this paper useful to those who may seek from it help in diagnosis, not only of the disease itself, but also of the many secondary results likely to ensue.

It will be convenient if we set out here the main divisions we have made, and the list of symptoms under each division. It must be remembered that we are dealing only with symptoms recorded in the cases under review.

CLASSIFICATION OF SYMPTOMS.

I. The symptoms due to local involvement of the stomach (including the state of the bowels and evacuations):—

Anorexia.
Dysphagia.
Nausea.
Flatulence.

Pain.
 Vomiting.
 Hæmatemesis.

Constipation.
 Diarrhœa.
 Melæna.

II. The physical signs due to local involvement of the stomach :—

Tumour.
 Dilatation.
 Visible peristalsis.

III. The symptoms and physical signs due to the effect of the disease upon the body generally, sometimes called cancerous cachexia, to which must be added as indistinguishable therefrom the results of malnutrition from defective assimilation of food :—

Weakness.
 Wasting.
 Anæmia.
 Pyrexia.
 Anasarca.
 Thrombosis.
 Parotiditis.
 Purpura.

IV. The symptoms and physical signs produced by the extension or dissemination of the growth to other parts of the body, including secondary inflammatory processes resulting therefrom :—

Ascites.
 Jaundice.
 Enlarged liver.
 Enlarged lymphatic glands.

Peritonitis.
 Pleurisy and empyema.

Growth at umbilicus.
 Growth in skin.
 Intestinal obstruction.
 Cerebral tumour.
 Paraplegia.
 Spontaneous fracture.

Latent cancer of the stomach.—Before we proceed to consider individual symptoms some reference must be made to cases in which the absence or insignificance of certain symptoms is responsible for the failure to recognise the existence of malignant disease of the stomach during life. A proportion of such cases has long been described by writers on this subject under the name of *latent gastric cancer*. We retain the term as a convenient one, but propose to make it more inclusive. The majority of writers have restricted the term of latent cancer to cases in which the patients die *from* cancer of the stomach without the existence of the disease being recognised during life. We propose to include in the term the cases of all patients who die *with* cancer of the stomach without the existence of the disease being recognised during life. Whichever use of the term is adopted, it is obvious that the size of the group embraced in latent gastric cancer in any series of cases will vary inversely with the care bestowed upon the investigation of each case, and the diagnostic power of the medical attendant. The more the attention of the profession is called to the existence of this condition of latency, the more likely is the obscurity of such cases to be penetrated. In our series twenty cases are indexed as *Latent*, and occur also under the heading “Absent gastric symptoms.” Of these twenty, seven died *with* but not *from* cancer of the stomach, and the failure to recognise the existence of the growth was due to the fact that the patient died of some entirely independent disease which masked the symptoms due to the cancer, if indeed the cancer was far enough advanced to give rise to any symptoms at all.

This small subdivision of seven cases is of interest because a study of some of the reports enables us to recognise the extent to which a stomach may be invaded by growth without apparently affecting the patient's health. The best example bearing on this point is No. 223, a case of a woman aged 81, who died from strangulated femoral hernia. The stomach is preserved in the Pathological Museum (Prep. 695) and is thus described :—

“A stomach laid open to show a slightly raised ulcerated growth extending from just within the pyloric ring along the lesser curvature for a distance of five inches, and affecting both walls of the organ so as almost to reach the greater curvature. The edges of the growth are raised and slightly everted,

and its ulcerated surface presents numerous gelatinous-looking nodules. On the reverse of the specimen the growth is seen to project as a lobulated mass beneath the serous coat. Histologically it is a spheroidal-celled carcinoma, many of the cells of which have undergone colloid degeneration."

In the history of the case given in the museum catalogue it is stated "there was no history of vomiting or other symptom of disease of the stomach until the onset of the intestinal obstruction four days before her death." A somewhat similar case, dying also from strangulated hernia, is recorded in No. 233. Here the malignant ulceration of the stomach was not so extensive, but there was a mass of secondary growth in the omentum. It is also stated that the patient had been melancholic for some time before the onset of her sudden illness, a circumstance which might explain the absence of a history of subjective symptoms.

In two other cases in this group the actual cause of death was pyelonephritis secondary to disease of the prostate. In one of these (No. 250) the patient was in the hospital twelve days, and although he became mentally deranged and ate little, it is stated in the report that there were no symptoms referred during life to gastric disease. Nevertheless there was an ulcer three inches in diameter, in the base of which the liver was exposed. In the other prostate case (No. 259) there was so small a cancerous plaque on the lesser curvature of the stomach that the absence of symptoms is in no way remarkable. Heart disease was responsible for the death of two cases in this subdivision, one being a case of ordinary chronic cardiac failure (No. 190) and the other of ulcerative endocarditis (No. 266). In the ulcerative endocarditis case the early stage and the position of the growth on the lesser curvature might well explain the absence of symptoms, whereas in the case dying from chronic cardiac failure it is easy to understand how some symptoms due to cancer of the stomach might have been attributed to the disease which actually proved fatal. In this case the growth was ulcerated, surrounded the pyloric end of the stomach, and was associated with secondary deposits in the mesenteric and lumbar glands. The last case to be mentioned in this group (No. 42) is one in which death was due to puerperal fever, the growth, a very early one, being limited to the mucous membrane and situated just within the pylorus.

It will be noted that the seven cases to which reference has just been made differ from those next to be considered, in that death could not in any way be attributed to the malignant disease of the stomach which for one reason or another was unrecognisable, or at least unrecognised. In the thirteen cases now to be analysed, gastric cancer was the undoubted though unrecognised cause of the fatal result, and, as already stated, it is to this class of case that former writers have generally restricted the term *latent* cancer of the stomach.

In the remaining cases while symptoms in the first and second groups of the scheme of classification set out above, viz., gastric symptoms, and gastric physical signs are absent, there exist some symptoms and physical signs out of the third or fourth group which may be briefly spoken of as the cachetic symptoms and the secondary symptoms. A cursory study of the thirteen cases in our second subdivision will show that there is a natural tendency for them to fall into two classes, according as the prominent symptoms are in the cachetic group or in the secondary group. If the cachetic symptoms predominate the case is likely to be regarded as one of pernicious anæmia, ulcerative endocarditis, or Bright's disease. If the secondary symptoms predominate malignant disease of some other organ, cirrhosis of the liver, or chronic peritonitis, is likely to be suspected. In reading an abstract of the clinical features of a case which is not written out until the post-mortem examination has solved the difficulty of diagnosis, it is not always easy to detect the uncertain and divergent views which have been held during life. But the obscurity of many of these cases is frankly commented upon in the reports before us, and the erroneous opinion of the physician in charge of the case clearly indicated. Especially is this the case when the physician in charge has happened also to be the pathologist making the post-mortem examination. The cases must be read at length to be appreciated. Four come under the cachetic group, Nos. 155, 169, 180, 297. Anæmia, wasting and anasarca were the commonest symptoms. Of the nine remaining cases of latent cancer of the

stomach, secondary deposits or their results so rivetted the attention of the observer that the indications of the primary lesion, if any existed, were entirely overlooked. In Nos. 123, 203, 235 and 255, attention was mainly fixed upon the liver either by reason of enlargement of the organ or of the presence of jaundice. In Nos. 57 and 127 secondary lesions of bone occasioning in one case spontaneous fracture of the femur, and in the other suppuration in the sternum, gave rise to the most prominent symptoms. Chronic ascites from malignant growth of the peritoneum masked the existence of gastric disease in No. 59. Paraplegia and hemiplegia, from secondary deposits in the cord and brain respectively, were the chief features in Nos. 224 and 257.

ANALYSIS OF SYMPTOMS.

We have already stated that the abstracts of the clinical reports which we have still further abbreviated for the purposes of this paper vary very much in respect of the fulness of detail they contain. Many of the abstracts are extremely brief, none is so full as to make one confident that every symptom referable to the disease which is recorded in the original report has been transcribed. No good purpose would therefore be served by endeavouring to estimate from our cases the actual frequency with which common symptoms presented themselves in the whole series, if indeed such information is at any time of much practical value. The relative frequency of at least the commoner symptoms can be deduced with sufficient accuracy from our cases, and for such value as these figures may have they are here set out:—

I. Gastric Symptoms.					
Anorexia ...	...	35	Vomiting ...	...	178
Dysphagia ...	...	10	Hæmatemesis ...	...	51
Nausea ...	...	6	Constipation ..	...	45
Flatulence ...	...	15	Diarrhœa ...	...	28
Pain ...	...	151	Melæna ...	...	16
II. Gastric Physical Signs.					
Tumour ...	...	132	Visible Peristalsis ...	...	17
Dilatation	...	30			
III. Cachetic Symptoms.					
Anæmia ...	...	31	Parotiditis ...	...	2
Anasarca ...	...	31	Purpura ...	...	1
Thrombosis	...	10			

IV. *Secondary Symptoms.*

Ascites	...	...	...	...	35
Jaundice	...	...	...	...	32
Enlarged Liver	...	...	...	...	86
Enlarged Lymphatic Glands	...	...	...	...	10
Umbilicus, Secondary Deposit	...	...	...	...	2
Skin	..	..	..	...	3
Intestinal Obstruction	...	...	...	...	5
Cerebral Tumour	...	...	...	...	1
Paraplegia	...	...	...	...	1
Spontaneous Fracture	...	...	...	...	1

We do not propose to deal in detail with each symptom in this long list. Out of the first group we have selected for special investigation the cases of dysphagia and hæmatemesis. Dysphagia attracted our attention because it is a somewhat rare symptom, and hæmatemesis because it is not uncommonly a prominent factor in causing death.

Dysphagia—*Carcinoma of cardiac orifice*.—Pain and discomfort following immediately after the ingestion of food, are frequently spoken of by the patient as difficulty in swallowing, and entered by an inexperienced reporter as dysphagia. We should not, therefore, have been surprised to have found this symptom more frequently recorded, and when recorded to have failed to detect any special anatomical explanation of its existence in the post-mortem report. As a matter of fact, however, of the small number of cases in which this symptom was noted, nearly all presented at the autopsy organic obstruction to the entrance of food into the stomach. There were ten instances of dysphagia in all, making about 3 per cent. of the total cases, and in only one can it be said that no anatomical explanation of the dysphagia was discovered at the autopsy. This is No. 49, in which the malignant growth was confined to the pyloric region of the stomach, and in which a gastro-colic fistula existed. In another case (No. 133) the pathologist draws attention to two conditions which might have been regarded as responsible for the dysphagia. In the mediastinum there was a chain of large fleshy glands continuous with masses of enlarged glands in the neck, and there was also a small secondary deposit at the cardiac end of the

œsophagus. Neither of these conditions seems to have caused obvious narrowing of the alimentary passage, and with regard to the secondary deposit in the œsophagus, it is stated that "it had produced no thickening of the walls and could have caused as yet no obstruction." In the remaining eight cases there was definite implication of the cardiac orifice of the stomach by malignant disease. So persistent was the dysphagia in four of the cases (Nos. 151, 267, 280 and 298) that the operation of gastrostomy was undertaken for its relief. In contrast with these cases is No. 212, in which although the patient was quite unable to swallow solid food, a tube was so easily passed through the obstruction that the stomach was washed out every day.

In one case (No. 241) the obstruction was thought to be due rather to the pressure of glands enlarged by secondary deposits than to the condition of the mucous membrane. In No. 281, in addition to a secondary deposit of spheroidal carcinoma at the cardiac orifice there was an independent growth of squamous epithelioma higher up in the œsophagus. A consideration of these cases would seem to justify the statement that when dysphagia is a prominent symptom in a case of malignant disease of the stomach, the cardiac orifice will generally be found involved in growth. The absence of dysphagia in gastric cancer does not, however, indicate that the cardiac orifice is free from disease. Twenty-five of our cases are indexed as examples of growth specially involving the cardiac end of the stomach—cases of general or nearly general infiltration of the viscus being excluded. In four of these cases it is specifically stated that the actual cardiac orifice is not involved. In twenty-one cases the opening from the œsophagus into the stomach was more or less invaded by malignant deposit, and in nine only of these is dysphagia recorded. When it is remembered that in all these cases the stomach is to a greater or less extent affected by malignant disease, it is not remarkable that a distinct difficulty in swallowing is not observed. We have elsewhere expressed the opinion based chiefly on histological considerations that these gastric growths involving the cardiac orifice are growths originating in the stomach and extending to the œsophagus, and

not, as has been believed by others, primary growths of the œsophagus. If our view is right the anorexia or voluntary limitation of diet induced by the disease of the stomach would be likely to render less obvious any mechanical difficulty in deglutition.

Hæmatemesis.—In rather more than a sixth of the cases having clinical histories it is recorded that the patient at some time during the course of the illness vomited blood or blood-stained material. An investigation of these forty-nine cases in which hæmatemesis occurred shows great divergence in the time of onset, in the persistence, and in the severity of the symptom. In some there is a history of a sudden attack of vomiting of blood as the first indication of illness, with or without recurrence of the symptom as the disease progressed. Such cases are Nos. 5, 139, 153, 178, 191, 251. The longest period before death at which the initial symptom appeared in these six cases was seven years, and the shortest one year. The question naturally arises, whether in such cases the initial hæmatemesis is due to simple gastric ulcer which subsequently becomes carcinomatous. Some of the six cases now mentioned have indeed already been considered from this point of view in another section of this paper. In contrast with these cases of early hæmatemesis may be noted those in which profuse vomiting of blood is the immediate precursor and ultimate cause of death. Six examples of immediately fatal hæmatemesis are recorded amongst our cases. The numbers are 22, 154, 161, 181, 185, 221. These cases are perhaps of sufficient importance to justify more detailed examination. The special feature of these cases to which we are alluding is thus briefly described in the notes: "Six hours before death he vomited a pint of clotted blood." "He brought up four ounces of blood and expired very quickly. At the autopsy the stomach contained much blood." "He was admitted, in a dying condition, for hæmatemesis. He rallied and seemed to be getting round, when he became collapsed and died as if from fresh hæmorrhage. The stomach contained a pound of blood-clot." "He had an attack of hæmatemesis and died prostrate." "Two days before death the patient vomited eight ounces of blood-clot with coffee-ground

matter. The next day hæmatemesis severe; could not be arrested. After death stomach contained twenty-one ounces of blood-clot." In these cases there can be no doubt that the hæmorrhage was the direct cause of death.

Still more striking perhaps is a small series of five cases occurring in our collection, in which gastric hæmorrhage proved fatal without any vomiting of blood. The following brief extracts from the reports indicate the condition :—

No. 43.—Stomach quite filled with blood, as also was the upper part of the intestine.

No. 85.—Stomach filled with hard clot.

No. 88.—The stomach was moulded on a great clot, whose surface was slightly digested. Blood extended through the bowel to the splenic flexure of the colon.

No. 109.—Stomach full of large clots of blood.

No. 258.—After sudden death the stomach was found dilated and containing a thick brownish fluid, mostly altered blood.

We have brought together these six cases of fatal hæmatemesis and five cases of fatal gastric hæmorrhage without hæmatemesis, because as a rule too little stress is laid upon hæmorrhage as a direct cause of death in cancer of the stomach.

It is hardly in accordance with the usual statements in the text-books that out of a series of cases of cancer of the stomach in which hæmatemesis is recorded as occurring in under 20 per cent. of the cases, nearly 4 per cent. of the whole number should prove fatal as the result of hæmorrhage. Perhaps the under-estimation of the frequency with which loss of blood is the cause of death in this disease is due to the fact that in many cases the existence of hæmorrhage is not discovered until the post-mortem examination. We have no figures to show whether the absence of vomiting of blood in cases of fatal gastric hæmorrhage is commoner in malignant disease of the stomach than in other diseases which usually cause hæmatemesis. On *a priori* grounds it seems likely that it should be so. Vomiting is a reflex act requiring activity of both nerve and muscle, and in the last stage of cancer of the stomach such activity is often absent. It is a common observation that the pain and vomiting which may have been very troublesome symptoms in the earlier stages of a case of cancer of the stomach, become much less obtrusive towards

the end. In fact, the explanation of the absence of hæmatemesis as a symptom of profuse and fatal gastric hæmorrhage, is very similar to the explanation which we shall have shortly to offer of the absence of the usual symptoms of peritonitis when perforation of the stomach occurs as a result of cancer.

If it should occur to any of our readers that the absence of a record of hæmatemesis in these five cases might be due to incompleteness of the reports we would draw attention to the difference in the post-mortem appearances in the two series of cases of fatal hæmorrhage—those with and those without hæmatemesis. Unfortunately the measurement or weight of the blood found in the stomach has not often been recorded, but the pathologist's description makes it clear that the quantity found at the post-mortem was much greater in those cases in which no mention of hæmatemesis is made. This is in accordance with one's expectation.

Turning now to the source of the fatal hæmorrhage, our cases bear out the usual statement that profuse bleeding is often explained by the ulceration of the growth into some vessel outside the stomach. In six out of the seven cases a definite source of bleeding apart from the ulcerated surface of the growth was found. In three instances the splenic artery was eroded; once an artery above the pancreas, possibly the pancreatico-duodenal, and once a branch of the gastric artery were found laid open. Once the source of hæmorrhage was the exposed and eroded spleen pulp. In one case the pathologist reports that no vessel could be detected, and in four cases no statement with regard to the source of hæmorrhage is made.

We have now dealt with profuse hæmatemesis occurring as the earliest symptom, and as the final event in the disease. Such profuse hæmorrhage was noted in twelve out of the forty-nine cases of hæmatemesis. Of the remainder there were six cases in which more or less profuse hæmorrhage was reported in the intermediate stages of the disease. For example:—No. 51, "a week before death he vomited half a pint of blood." No. 101, "four months before death he vomited blood on several occasions largely." No. 117, "four months before death vomited half a pint of blood."

No. 192, "bringing up a considerable quantity of blood." No. 194, "a month before death vomited a quart of clotted blood." No. 252, "one month before death lost a pint of blood." Altogether there are eighteen cases in which the description would lead one to infer that blood was vomited in large quantities and not much altered by the process of digestion. On the other hand, there are twenty-two cases in which it is distinctly stated that the hæmorrhage was quite small in quantity, or if more profuse, that the blood was altered by the process of digestion. The following are some of the terms used to describe the vomited material: "altered blood," "coffee-ground material," "streaks of blood," "dark brown or nearly black," "black stuff," "dark matter," "coffee-coloured," "pale brown colour containing blood." In the remaining eight cases no further details are given than the bare statement that the patient vomited blood or suffered from hæmatemesis. Assuming that these were all cases in which small quantities of altered blood were vomited, our collection gives a proportion of three cases in which profuse unaltered blood was vomited, to five cases in which the blood was scanty or affected by digestion.

Peritonitis—Perforation of the stomach.—Although by so doing we shall be departing from the order set out in the classification of symptoms given above, we propose now to draw attention to the cases which presented signs either clinical or pathological of acute peritonitis. We have included peritonitis in the group of symptoms produced by the extension and dissemination of the growth to other parts of the body, including secondary inflammatory processes resulting therefrom. Acute peritonitis is generally produced by a communication becoming established between the stomach and the peritoneal cavity, and of our thirty-two cases of acute peritonitis thirteen are attributable to perforation of the gastric wall. At the same time there are seven cases of perforation of the stomach which did not result in general peritonitis, but caused only a local peritoneal abscess. It will be convenient to consider these twenty cases of perforation of the stomach together, and for this purpose we have prepared a table showing some of their most important features.

TABLE OF CASES OF PERFORATION OF THE STOMACH.

Case No.	Sex.	Age.	Duration of illness.	Clinical Evidence of Perforation.	Duration of life after Perforation.	General Peritonitis.	Localised Peritoneal Abscess.	Situation of Perforation.
5	M	43	12 months. Hæmatemesis at onset.	Sudden severe lancinating pain in abdomen extending to the back.	? 73 days	—	Abscess cavity from liver to spleen.	1 inch from pylorus.
16	M	51	In hospital 6 weeks.	[History incomplete]	—	2 pints of opaque serum and lymph.	—	3 inches from pylorus in centre of a large ulcer whose base partly formed by liver.
26	M	65	In hospital 4 weeks.	[History incomplete]	—	Yes	—	Lesser curvature.
28	M	—	—	[History incomplete]	—	Yes	—	Several places.
49	M	61	11 months	No evidence	—	—	Small abscess between stomach and abdominal wall	Anterior wall near pylorus.
60	M	43	In hospital 10 days	[History incomplete]	—	Yes	—	? Pylorus.
63	M	56	In hospital 4½ months.	No evidence. "Vomiting ceased and did not recur at all during last month; for this period he lay in an almost moribund condition."	—	—	Small abscess over lesser curvature.	At edge of portion of stomach adherent to the liver.
75	M	—	—	Suddenly seized with peritonitis	—	Yes	—	—

TABLE OF CASES—continued.

Case No.	Sex.	Age.	Duration of illness.	Clinical Evidence of Perforation.	Duration of life after Perforation.	General Peritonitis.	Localised Peritoneal Abscess.	Situation of Perforation.
79	M	45	Tumour 12 months.	[History incomplete]	—	—	Abscess in front of liver and pylorus.	Near pylorus.
104	F	56	In hospital at least 4 months.	No evidence	—	—	Isolated abscess in lesser sac of peritoneum.	Posterior wall near lesser curvature.
117	F	50	4 months. Hæmatemesis at onset.	Sudden attack of abdominal pain	26 days	Yes Secondary to rupture of local abscess.	A cyst containing chocolate-coloured fluid between pylorus and liver.	Near pylorus.
138	M	43	3 months	While driving a tramcar, sudden pain, so severe as to make him fall. Was admitted same day with symptoms of peritonitis. T. 100.5. P. 128	5 days	A quantity of bile-coloured fluid and lymph in cavity	—	Anterior wall near pylorus.
144	F	55	18 months	No evidence. "She gradually sank"	—	Yes	—	Close to under surface of liver.
174	M	49	6 months	May 18th.—On attempting to get out of bed he shrieked with pain. In the afternoon was again in great agony. 19th.—Dr. Fagge says: "I found him lying insensible, or nearly so, with white leaden lips and cheeks, apparently from the effect of internal hæmorrhage. There was no tenderness of the abdomen." 20th.—Died.	About 48 hrs.	A considerable quantity of puriform fluid.	—	Middle of anterior wall.

TABLE OF CASES—continued.

Case No.	Sex.	Age.	Duration of illness.	Clinical Evidence of Perforation.	Duration of life after Perforation.	General Peritonitis.	Localised Peritoneal Abscess.	Situation of Perforation.
178	M	39	Attacks of pain, vomiting & hæmatemesis 7 years.	Feb. 13th.—Attacked with vomiting and severe pain in the stomach. P. 136 and small. Afterwards rallied somewhat, and died early on the 15th, bathed in perspiration.	About 48 hrs.	"Much lymph and some fluid from the stomach."	—	Aperture size of pin's head on anterior wall near pylorus.
227	M	42	About 2 years.	No evidence. "He gradually sank and died. There were no marked signs of peritonitis. He lay moribund several days before the fatal issue."	—	Purulent peritonitis, the abdomen containing 3 pints of turbid fluid.	—	Not ascertained, owing to tearing in removal.
243	M	64	Over 4 months.	No evidence. Diarrhoea and syncope day before death.	—	Intestines covered with recent lymph.	—	Lesser curvature, close to œsophagus.
248	F	56	About a year.	No evidence. "The prominent symptom was ascites. Growth of the stomach was not suspected, still less perforation."	—	13 pints of turbid fluid and a quantity of stringy lymph.	—	Admitting little finger, close to pylorus.
262	F	40	12 months	No evidence. 18 days before death colotomy was performed for rectal growth, neither cancer of stomach or perforation being suspected.	—	80 ounces of yellow fluid, containing much pus.	—	Lesser curvature, close to pylorus.
269	M	63	11 months	No evidence. "He grew weaker and ascites came on, not apparently attended with any pain in the abdomen."	—	General purulent peritonitis; 126 ounces of turbid fluid.	—	Anterior surface one inch from pylorus.

Fifteen of these patients were males and five females, the oldest was sixty-five and the youngest thirty-nine, indicating, as we should have expected, that age and sex have no marked influence on the occurrence of perforation. The average duration of the fatal illness in these cases, excluding one of very unusual length, is between eleven and twelve months, the shortest case being three months. It does not, therefore, appear that this accident is likely to occur in the early stages of the disease, or to be the first indication of ill-health, as is not uncommonly the case in perforating gastric ulcer. In only one case indeed (No. 138) did symptoms of perforation occur while the patient was still in a condition to be following his occupation. But perhaps one of the most striking features of these cases is the infrequency with which any clinical evidence is forthcoming that perforation has taken place. The histories of fifteen of the cases are given in sufficient detail to make it extremely unlikely that any sudden accession of pain or other severe symptom indicating perforation should have escaped record. In nine of these fifteen there is no clinical evidence of perforation having taken place. The following are some of the final clinical notes made in these cases:—
“Vomiting ceased and did not recur at all during the last month; for this period he lay in an almost moribund condition.” “He gradually sank and died. There were no marked signs of peritonitis. He lay moribund several days before the fatal issue.” “He grew weaker and ascites came on, not apparently attended with any pain in the abdomen.”

In all the other six cases there was some symptom or sign which might have aroused suspicions as to the onset of acute peritonitis, and in one or two there were such sudden and acute developments as perhaps to have justified a diagnosis of perforation. It is not, however, clear from the reports that such a diagnosis was actually made in any instance. Of one such case (No. 174) it is recorded that two days before his death “on attempting to get out of bed he shrieked with pain. In the afternoon was again in great agony.” On the day before his death, Dr. Fagge says, “I found him lying insensible, or nearly so, with white leaden lips and cheeks, apparently from the effect of internal hæmorrhage.

There was no tenderness of the abdomen." Case 138 is that of a driver of a tramcar who, while following his occupation, was seized with sudden pain so severe as to make him fall down. Later in the day he was admitted to the hospital with symptoms of peritonitis, his temperature being 100·5° F. and pulse 128. Acute general peritonitis proved fatal five days later. In a third case, in which the onset of acute general peritonitis was indicated by well-marked symptoms, death took place in forty-eight hours. In a recent case at Guy's Hospital not included amongst those recorded in this paper, death occurred nine hours after the onset of symptoms indicating perforation. In all these four rapidly fatal cases the peritonitis was general. Death is not so rapidly caused in cases in which a localised peritoneal abscess results from the perforation. In only two cases of this kind, however, is there any evidence of the date at which the perforation took place, and in neither instance is this evidence conclusive. One (No. 5) survived the accident seventy-three days, and the other (No. 117) lived twenty-six days. In the latter case, death seems to have been due to the subsequent rupture of the localised abscess into the general peritoneal cavity. This case is therefore tabulated amongst our cases of perforation of the stomach as producing both a localised abscess and a general peritonitis, so that of our twenty cases of perforation of the stomach, there are six instances of localised and fifteen of general peritonitis.

The difficulty of recognising the existence of perforation of the stomach, or of the resulting peritonitis, in cases of cancer is in striking contrast with the conspicuous symptoms produced by analogous conditions in simple gastric ulcer. The most important explanation for this difference is to be found in the serious condition of the cancerous patient at the time of the accident. As is frequently indicated in the accompanying reports, many cases are lying moribund when the extravasation takes place. They are insensitive to pain, and have not sufficient vitality to respond to reflex irritation by vomiting or exhibiting rigidity of the abdominal wall. Another possible explanation is to be found in the character of the contents of the stomach. In simple gastric ulcer the symptoms of perforation are known to vary according to the interval that has elapsed since the last meal and to the

nature of the food then ingested. The small quantity of milk usually taken by a patient with advanced gastric cancer is not likely to set up much irritation of the peritoneum. The absence of free hydrochloric acid from the gastric juice would tend to lessen irritative action. In many of these cases, too, the peritoneum is already the seat of cancer, and perhaps, therefore, less sensitive, while the presence of ascitic fluid would dilute the extravasated gastric contents.

But the difficulty in arriving at an accurate diagnosis of the existence of perforation in malignant disease of the stomach is not only dependent on the frequent absence of symptoms. Patients suffering from advanced gastric cancer occasionally show signs of sudden abdominal collapse which may lead to a suspicion of perforation having taken place, but which are found after death to be due to some other cause. Four such cases of fatal collapse are indexed, the numbers being as follows:—109, 124, 140, 220. In one of these profuse hæmorrhage into the stomach explained the collapse, in two others some cardiac condition was responsible—one pulmonary embolism, the other dilatation of the heart. In the fourth case the fatal collapse followed washing out the stomach, an accident which, though frequently noted by various authors, appears only once to have occurred amongst our cases. Acute peritonitis, sometimes with, but more often without any special symptoms whereby it might be recognised, may occur in association with cancer of the stomach without any perforation of the viscus. Nineteen such cases are entered in the index, but on analysing them it appears that in twelve of them some operation such as paracentesis, exploratory laparotomy, gastrostomy and gastro-enterostomy had been performed a short time before death, and was probably responsible for the inflammation. There still remain seven cases in which acute peritonitis, as evidenced by the presence of pus or lymph amongst the coils of intestine, appears to have spontaneously developed in the course of cancer of the stomach. The softening of secondary deposits is the most likely origin of the acute inflammatory process.

The question of chronic peritonitis will be dealt with when ascites is discussed.

(To be continued.)

INDEX TO THE APPENDIX.

Abdominal Wall invaded by Growth	...	...	...	76, 78, 136, 172
Absence of Gastric Symptoms	42, 57, 59, 123, 127, 155, 169, 180, 190, 203,			
	223, 224, 233, 235, 250, 255, 257, 259, 266, 297			
Anæmia	18, 38, 55, 64, 67, 78, 86, 101, 114, 120, 124, 135, 146, 152, 153, 155,			
	162, 169, 188, 192, 201, 206, 217, 243, 271, 274, 285, 289, 301,			
				303, 305
Anasarca	10, 32, 33, 34, 49, 101—103, 112, 114, 120, 155, 164, 168, 176, 183,			
	195, 212, 221, 233, 249, 255, 271, 279, 285, 291, 292, 297, 299,			
				303, 306
Anorexia	2, 9, 11, 33, 48, 52, 67, 74, 85, 100, 101, 105, 106, 121, 128, 134, 136,			
	145, 147, 154, 166, 168, 180, 197, 211, 212, 217, 232, 237, 249,			
				254, 258, 300, 302, 305
Alcoholism	5, 49, 51, 54, 59, 88, 93, 95, 107, 124, 143, 150, 179, 231, 239,			
				271, 295, 303
Arteries Eroded	...	...	...	85, 88, 154, 185, 243
	Embolism or Thrombosis; <i>see</i> Embolism or Thrombosis.			
Artery, Obliterated Hypogastric Growth in	...	...	...	184
Ascites (<i>recognised clinically</i>)	3, 9, 17, 46, 59, 66, 68, 95, 102, 111, 112, 114,			
	120, 125, 131, 133, 155, 157, 158, 164, 168, 194, 202, 234,			
	238, 243, 255, 269, 271, 279, 289, 291, 292, 297, 306; and			
	<i>see also</i> Peritoneum, Serous fluid in.			
Bedsore	...	...	...	149, 224
Brain, Abscess, Secondary Deposit; <i>see</i> Cerebral Abscess and Cerebral Tumour.				
Bronchi, Secondary Deposits in	...	...	...	216
Cæcum, Gangrene of	...	...	...	21
	Secondary Deposit in	...	...	34
Cancer Cells in Vomit	...	...	...	88, 184
Cardiac End, Growth of	17, 55, 67, 96, 133, 143, 146, 151, 161, 173, 205, 212,			
	216, 241, 257, 267, 271, 274, 278, 279, 280, 281, 292, 298, 300			
Cerebral Abscess	...	...	...	139
	Hæmorrhage	...	...	149
	Tumour	...	...	257
Collapse, Sudden, without Perforation	...	...	...	109, 124, 140, 220
Colon, Contracted	...	...	...	36, 200, 209, 213, 240
	Fistula to Stomach	...	...	34, 49, 156, 175, 191
	Hypertrophied	...	...	27, 59
	Inflamed	...	...	25, 141
	Invaded by Growth	...	...	102, 106, 258
	Secondary Deposits	...	...	95, 100, 248
	Ulceration	...	...	32, 183

Constipation	2, 5, 6, 8, 10, 25, 31, 49, 90, 98, 105, 111, 112, 114, 115, 117, 120, 128, 131, 134, 138, 147, 157, 168, 175, 179, 186, 191, 197, 201, 204, 217, 218, 230, 243, 258, 263, 272, 276, 277, 282, 285, 299, 300, 305
Cystitis	224
Diarrhoea	7, 9, 18, 32, 95, 104, 106, 155, 158, 180, 191, 194, 200, 201, 221, 226, 238, 243, 246, 263; 265, 268, 271, 274, 285, 289, 290, 292
Dilatation of Stomach	8, 20, 23, 35, 39, 121, 122, 132, 142, 147, 185, 186, 214, 218, 220, 236, 247, 256, 258, 262, 263, 264, 265, 270, 275, 282, 295, 304, 305, 306
Duodenum, Abscess opening into	104
Blood-clot in	191
Fistula to Stomach	16
Growth extending into	175, 188, 242, 247, 260, 293
Invading from Outside	258, 284
Secondary Deposits	239
Dysphagia	49, 133, 151, 212, 241, 267, 278, 280, 281, 298
Embolism, Pulmonary	123, 140, 141, 184, 203, 209
Empyema, <i>see</i> Pleura, Pus in.	
Erysipelas of Face	49
Fallopian Tube, Secondary Deposit in	114, 158
Femur, Secondary Deposit and Spontaneous Fracture of	57
Gall-bladder: <i>see</i> Liver.	
Glands, Lymphatic, Enlarged (<i>clinically</i>)	45, 97, 135, 136, 146, 170, 175, 203, 204, 281
Axillary, Caseous	91
Cervical, Caseous	45
Secondary Deposits	88, 97, 130, 135, 203, 218, 228, 237, 257
Inguinal, Caseous	11
Secondary Deposits	69, 135, 136
Intra-abdominal, Secondary Deposits, <i>Passim</i> .	
Intra-thoracic, Secondary Deposits	2, 31, 89, 93, 95, 102, 125, 130, 133, 135, 141, 145, 146, 165, 204, 211, 218, 227, 230, 232, 237, 251, 299
Hæmatemesis	5, 12, 22, 25, 38, 39, 51, 86, 94, 98, 100, 101, 104, 116, 117, 125, 130, 139, 142, 144, 153, 154, 161, 171, 178, 181, 185, 191, 192, 194, 204, 212, 216, 218, 221, 227—229, 239, 243, 244, 246, 248, 251—253, 270, 287, 299, 306
Heart, Aortic Valves Thickened	161, 177
Vegetations on... ..	81, 139, 292
Coronary Arteries Atheromatous	1, 241
Endocarditis, Acute	155
Chronic... ..	155, 165
Ulcerative	266
Fatty Degeneration	210, 300
Infarction	119
Mitral Valve Stenosed	190
Thickened	156, 158, 267, 286, 305
Vegetations on	158
Secondary Deposits in	146, 218, 292
Ventricle, Left, Ante-mortem Thrombus	119

Hernia, Inguinal	...	...	...	...	...	...	...	233
Intestinal Obstruction	...	...	...	...	...	14, 131, 197, 235,	240	
Intestine, Secondary Deposits in	..	...	...	...	...	95, 215,	234	
Tubercle of	...	...	...	...	...	...	285	
Ischio-rectal Abscess	...	...	...	...	...	...	106	
Jaundice	3, 5, 12, 29, 40, 47, 69, 80, 84, 90, 93, 99, 118, 119, 121, 146, 149,					166, 173, 187, 203, 221, 229—231, 235, 238, 255, 260, 265,		
						279, 299		
Kidney, Cysts	...	...	...	...	...	2, 83, 155,	281	
Granular	28, 33—35, 41, 76, 117, 129, 148—150, 171, 178, 187, 205,					211, 223, 225, 232, 242, 303		
Pelvis, Dilated	...	...	...	...	153, 203, 209, 229, 236,	253		
Pyelo-nephritis	...	...	...	...	...	101, 224, 250, 259		
Secondary Deposits	25, 28, 43, 58, 67, 69, 71, 135, 146, 206, 230,					231, 251		
Knee, Tubercle of	...	...	...	...	...	...	162	
Larynx, Decubital Ulcer of	...	...	...	...	...	...	119, 170	
Latent Cases; see Absence of Gastric Symptoms.								
Liver enlarged (<i>clinically</i>)	43, 47, 48, 54, 68, 93, 113, 115, 117, 123, 140, 144,					146, 149, 187, 204, 205, 221, 229—231, 237—239, 255, 258,		
						260, 261, 264, 265, 269, 276, 279, 282, 299, 300		
Abscess of	...	...	...	...	...	...	194, 214	
Atrophy, Simple	82, 90, 121, 129, 132, 133, 142, 143, 145, 150, 153,					160, 166, 170, 198, 215, 241, 242, 245, 263		
Cirrhosis	...	...	...	...	...	...	28, 101, 231	
Cyst	...	...	...	...	...	...	93, 182	
Ducts, Dilated	12, 29, 69, 80, 84, 89, 93, 131, 133, 149, 153, 166, 173,					235, 265		
Invaded by Growth	...	...	...	...	69, 84, 93, 104, 166			
Obstructed	29, 47, 99, 112, 149, 166, 173, 192, 221, 229, 235,					260, 265		
Gall-bladder, Dilated	...	...	...	...	...	93, 99, 229, 265		
Invaded by Growth	...	...	...	...	...	86, 258		
Obliterated	...	...	...	...	...	...	7	
Secondary Deposits in	...	...	...	...	...	122, 237		
Gall-stones	84, 96, 131, 133, 148, 198, 207, 217, 223, 229, 258, 262, 286							
Invaded by Growth	43, 50, 153, 173, 176, 180, 193, 199, 204, 250, 268,					288, 289, 299		
Lardaceous	...	...	...	...	...	...	165	
Necrosis of	...	...	...	...	...	...	148, 173, 268	
Secondary Deposits	2, 3, 5, 9, 11, 13—15, 17, 18, 22, 24, 26, 37, 38,					40, 43, 45, 47, 48, 54, 57, 58, 64—68, 70—72, 76—78, 80,		
						84—87, 89, 92, 93, 96, 97, 100, 111, 113, 117, 118, 122, 123,		
						125, 127, 128, 130, 131—133, 135—137, 140, 141, 146, 148,		
						149, 163, 165—167, 169, 170, 177, 179, 183, 184, 185, 187,		
						189, 192, 197, 201—203, 205, 206, 211, 212, 214, 220, 221,		
						225—232, 237—239, 247, 249, 251, 252, 255, 257, 258, 260,		
						261, 265, 268, 270, 272, 276, 279, 286, 288, 293, 299, 300, 305		

Lung, Broncho-pneumonia (hypostatic, &c.)	11, 36, 45, 62, 64, 69, 87, 96, 98, 107, 112, 128, 150, 155, 170, 182, 187, 188, 197, 198, 215, 228, 231, 240, 241, 255, 258, 263, 264, 265, 273, 277, 278, 280, 287, 294, 302
Infarction	... .. 193, 209, 285, 290
Lobar pneumonia	... .. 198
Secondary Deposits	38, 43, 55, 57, 66, 71, 80, 93, 96, 122, 133, 144—146, 183, 187, 206, 211, 237, 257, 276
Tuberculosis (active or quiescent)	1, 20, 28, 31, 35, 37, 39, 51, 52, 72, 112, 125, 135, 141, 154, 169, 201, 226, 231, 236, 243, 247—249, 263, 265, 267, 269, 270, 271, 276, 281, 282, 285, 306
Melæna	5, 94, 114, 117, 121, 124, 130, 144, 153, 174, 229, 230, 239, 244, 251, 299
Esophagus, Dilatation	... .. 122, 241
Epithelioma	... .. 281
Growth Extending into	143, 151, 204, 205, 212, 216, 241, 257, 274, 278, 280, 281, 292, 298
Hypertrophy	... .. 17, 194
Inflammation	... .. 188
Perforation	... .. 67
Secondary Deposits	... .. 267
Ulceration	... .. 134
Operations, Cock's	... .. 197
Colotomy	... .. 240, 262
Enterostomy	... .. 193
Gastrectomy	... .. 245, 294
Gastro-enterostomy	251, 252, 264, 273, 277, 293, 295, 296, 302, 304
Gastrostomy	... .. 267, 280, 281, 298
Laparotomy, Exploratory	... .. 186, 272, 283, 284, 301
Ovary, Cyst	... .. 201, 222
Secondary Deposits	... .. 24, 31, 44, 45, 114, 126, 166, 168, 262
Pancreas, Ducts Dilated	... .. 12, 130
Invaded by Growth	40, 45, 54, 65, 76, 85, 127, 130, 174, 179, 215, 221, 231, 264, 265, 293
Secondary Deposits	16, 70, 71, 172, 235, 257, 271, 284, 286, 292, 295, 296
Sarcoma of	... .. 165
Parotid, Inflamed	... .. 222, 305
Pericardium, Adherent	... .. 288
Serous Effusion	... .. 212
Secondary Deposits	... .. 43, 95, 203, 218, 231
Peristalsis, Visible Gastric	6, 90, 111, 115, 121, 142, 143, 147, 150, 160, 171, 210, 220, 246, 263, 304, 306
Peritoneum, Blood Clot	... .. 167, 202
Fluid, Milky, in...	... .. 237
Fluid, Serous, in	3, 7, 17, 37, 50, 59, 68, 95, 102, 103, 112, 114, 123, 125, 131, 136, 143, 146, 155, 157, 164, 166, 194, 195, 197, 202, 204, 206, 209, 214, 225, 230, 234, 235, 238, 248, 251, 255, 261, 262, 271, 276, 279, 281, 291, 292, 299, 306

Peritoneum, Secondary Deposits in	1, 5, 6, 8, 9, 14, 15, 17, 27, 31, 36, 41, 50, 65, 66, 69, 76, 82, 84, 95, 98, 99, 102, 111, 114, 115, 120, 125, 126, 131, 133, 136, 137, 139, 150, 155, 157, 158, 165, 166, 168, 170, 171, 176, 179, 184, 194, 200, 202, 203, 204, 206, 208 —210, 216, 220, 230, 233, 235, 240, 253, 263, 267, 269, 281, 284, 287, 288, 289, 291, 292, 295, 306
Peritonitis, General Acute	16, 26, 28, 50, 59, 60, 75, 113, 114, 120, 126, 138, 144, 158, 168, 174, 178, ? 185, 189, 193, 225, 227, 240, 243, 262, 269, 273, 277, 280, 281, 296, 301
General Chronic ...	... 112, 164, 197, 200, 248, 263, 291, 297
Localised Suppurative ...	... 5, 63, 79, 104, 169, 219, 283, 284
Pleura, Pus in ...	... 44, 219, 279, 280, 293
Secondary Deposits in	9, 11, 14, 43, 66, 67, 85, 89, 95, 111, 146, 184, 206, 216, 257, 270, 282, 292
Serous Fluid in	5, 13, 14, 17, 31, 35, 55, 82, 102, 110, 153, 184, 195, 209, 211, 226, 230, 235, 237, 238, 248, 279, 284, 292, 297, 299
Pleurisy	37, 54, 79, 80, 87, 89, 105, 110, 153, 187, 224, 237, 238, 277, 287, 300
Portal Vein Invaded by Growth	... 234
Thrombosis, <i>see</i> Thrombosis.	
Previous Chronic Dyspepsia	2, 13, 36, 39, 144, 178, 179, 196, 215, 229, 240, 245, 252, 295, 304
Prostate, Abscess	... 259
Purpura	... 34
Receptaculum Chyli, Secondary Deposits in	... 146
Rectum, Secondary Deposit	... 235, 262
Ulceration	... 35, 156, 203
Sarcoma of Stomach	... 44, 65, 69, 107, 153, 161, 200, 284
Scrotum, Sloughing of	... 106
Secondary Deposits, <i>see</i> Brain, Bronchi, Cæcum, Colon, Duodenum, Fallopian Tube, Femur, Gall-bladder, Glands, Heart-Muscle, Intestine, Kidney, Liver, Lung, Oesophagus, Ovary, Pancreas, Pericardium, Peritoneum, Pleura, Receptaculum Chyli, Rectum, Skin, Skull, Spinal Cord, Spleen, Sternum, Stomach, Suprarenal, Testis, Thyroid, Umbilicus, Uterus, Vermiform Appendix.	
Skin, Deeply Pigmented	... 30, 32, 73
Secondary Deposits	... 204, 208, 218
Skull, Secondary Deposit	... 206
Syphilitic Necrosis	... 117
Solar Plexus, Involved in Growth	... 88, 102, 166, 230
Spinal Cord, Secondary Deposits	... 224
Spleen, Abscesses	... 174
Hæmorrhage from	... 161
Infarcts	... 35, 136, 235, 279
Invaded by Growth	... 161, 235, 271
Secondary Deposits	... 11
Sternum, Secondary Deposit	... 127(?), 206
Stomach, Blood in	... 43, 85, 88, 104, 109, 154, 161, 221, 243, 258
Perforation	5, 16, 26, 28, 49, 60, 63, 75, 79, 104, 117, 138, 144, 174, 178, 227, 243, 248, 262, 269

Stomach, Ulcer, Simple	139, 190, 203, 207, 209, 238, 240, 243, 295, 297, 304, 305
Secondary Growth ...	... .. 19
Subserous Abscess ...	... .. 239
Suprarenal invaded by Growth	... .. 96
Secondary Deposits	1, 65, 81, 146, 155, 166, 206, 211, 213, 231, 237, 241, 253
Tubercle of	... .. 51
Syphilis ...	... .. 170, 177, 203
Testis, Fibroid ...	... .. 177, 234
Gumma ...	... .. 170
Secondary Deposit	... .. 100, 136
Thrombosis (<i>recognised clinically</i>)	32, 100, 110, 136, 193, 206, 222, 232, 292, 305
Thrombosis, Arterial—	
Aorta ...	... .. 34
Gastro-duodenal	... .. 117
Pulmonary	... .. 165, 169, 208, 258, 290
Thrombosis, Venous—	
Femoral ...	... .. 89, 123, 136, 140, 155, 184, 198, 305
Gastric ...	... .. 86, 167
Iliac ...	... .. 34, 136, 141, 198, 206, 222, 292
Inferior Cava ...	34, 136, 164, 166, 202, 203, 206, 222, 225, 229
Innominate ...	... .. 203
Internal Saphenous ...	... .. 292
Portal ...	... .. 86, 166, 167, 185, 186, 202, 249, 255, 261
Prostatic ...	... .. 155, 208
Splenic ...	... .. 166
Uterine ...	... .. 222
Thyroid Gland, Atrophy	... .. 187
Cyst ...	... .. 201, 239, 258, 296
Secondary Deposits	... .. 231
Tumour, Gastric (<i>recognised clinically</i>)	2, 5—11, 30, 33, 34, 37, 39, 41, 44, 45, 49, 52, 55, 56, 60, 61, 63, 69, 76, 78—80, 84, 89, 90, 93, 94, 97, 98, 100, 106, 116—119, 125, 127—130, 132, 135, 136, 142, 145, 147, 148, 150, 152—154, 157, 159, 160, 164—166, 170, 172, 175, 179, 183—186, 188, 192, 195, 198, 199, 201, 202, 204—207, 210—220, 222, 226—228, 232, 234, 236, 237, 242—245, 247, 249, 251—253, 258, 264, 268, 273, 275—277, 282—286, 288—291, 296, 299, 301—303, 305
Umbilicus, Abscess Opening at	... .. 214
Secondary Deposits	... .. 157, 184
Uterus, Fibroid ...	... .. 30, 56
Secondary Deposits	... .. 166
Vein, Iliac, invaded by Growth	... .. 206
Inferior Cava, invaded by Growth	... .. 102, 204, 225
Obliterated Umbilical, Growth in	... .. 157, 171, 184
Veins, Thrombosis; <i>see</i> Thrombosis, Venous.	
Vermiform Appendix, Secondary Deposits ...	... .. 158, 184

APPENDIX.

CASE 1. *Carcinomatous ulceration of pyloric end of stomach. Secondary deposits in peritoneum and suprarenal capsules. Phthisis.*—John D., æt. 72, was admitted under Dr. Bright on the 15th February, 1826, and died on the 20th of the same month. He was greatly emaciated and his debility was extreme. He had cough and complained that before admission he had been subject to frequent vomiting, but this symptom did not return after his admission. His bowels were obedient to medicine and his stools were tolerably healthy. At the autopsy the lungs were loaded with tuberculous matter and were in rather an emphysematous state. The heart was enlarged, the coronary arteries being thickened. The peritoneum on the liver and stomach and that forming the omentum, which was much contracted, was covered with an infinite number of minute yellow miliary granulations apparently fungoid in character. The stomach is preserved in the Museum forming Preparation No. 680. It is thus described: "A portion of a stomach showing a large irregular ulcer situated upon its posterior wall about two inches from the pylorus. The ulceration exposes the muscular coat of the organ and has a thick everted margin, infiltrated with growth. Continuous with the thickened edge there is a large fungating mass obliterating the pyloric orifice. Histologically the growth is a cylindrical-celled carcinoma." The intestines, liver, spleen, pancreas and kidneys were healthy. The left suprarenal capsule was enlarged to the size of a hen's egg. It was converted into a fungoid mass containing in its centre a large clot of blood. The neighbouring lymphatic glands contained deposit. See *Red Insp. Book*, p. 166; and *Prep.* 680.

CASE 2. *Carcinomatous infiltration and contraction of the stomach with subserous lobulated tumours. Secondary deposits in lymphatic glands and in the liver.*—A female, æt. 56, was a patient of Dr. Millar, at the London Dispensary, and died in November, 1828. She had long been the subject of indigestion, but had been laid up by illness only about eighteen months. She could at first take but very little food, and complained of great pain about the scrobiculus cordis, in the lower part of which, rather to the left, an indurated tumour might be felt. Her bowels were constipated, and she was much emaciated. For some months she had no vomiting; but when she did vomit, the act always occurred after taking food, of which she could retain nothing except in liquid form. Subsequently a small tumour was felt rather towards the right hypochondrium. The patient became extremely emaciated, and her skin was very dry and harsh and scurfy. At one time she suffered from palpitation of the heart, which excited the idea that that organ might be diseased; but before any vomiting had occurred her case was considered as scorrruous or fungus of the stomach, and the tumour was supposed to be situated to the left of the pylorus. At the autopsy, the stomach was seen, when the abdomen was opened, to be contracted to a very small size, its cavity being incapable of holding more than a very few ounces. The left

extremity was pretty healthy, and near the pylorus it was likewise healthy; but a very little further to the left the coats of the stomach for the space of about three inches were very much thickened by a malignant deposit, and degeneration externally producing an irregular tumour, and internally showing an irregular and partially ulcerated surface. An incision through the coats of the organ exhibited a whitish semi-translucent surface, sprinkled with yellowish, opaque points. Along the greater curvature of the stomach, but chiefly at that part which corresponded with the diseased portion just described, there was a bunch of closely-united, roundish tubercles, for the most part of small size. One or two of the largest might be equal in size to a pigeon's egg. They were of a malignant character, and for the most part in a state of softening. The lymphatic glands about the spine, posteriorly to the stomach, and at the lower part of the posterior mediastinum were much enlarged, and contained secondary deposits. The liver also contained secondary deposits, most of which were of small size, but one situated close to the gall-bladder was about as large as an egg. One of the kidneys contained a considerable-sized cyst; but they were practically healthy organs. There were no other secondary deposits. The uterus was small, and the ovaries wasted. *See Insp.*, vol. 6, p. 76.

CASE 3. *Carcinomatous ulcer of pyloric end of stomach. Secondary deposits in liver. Jaundice and ascites.*—James S., æt. circa 45, was admitted under Dr. Back, in 1828, for jaundice and wasting. Nine days later he died, and at the autopsy, the pyloric extremity of the stomach was found to be much thickened and indurated, presenting internally an ulcer of considerable size with a raised, circular margin. The liver was large and exhibited numerous secondary deposits, varying in size, and for the most part of a bright opaque colour internally, and more transparent and colourless externally. The abdominal cavity contained much bile-stained serum. *See Insp.*, vol. 7, p. 42.

CASE 4. *Diffuse carcinoma of the stomach. Secondary deposits in glands.*—Mr. W., æt. circ. 50, a patient of Dr. Babington's. He had generally enjoyed good health and had been regular in his habits. His business required him to rise about 5 a.m., and he accustomed himself to take a large quantity of tea, having recourse to it five or six times a day. He had of late been subject to much mental anxiety. His complaint, which was of only a few months' duration, was regarded as dependent on organic disease of the stomach. He had the greatest difficulty in retaining anything on his stomach, he vomited shortly after swallowing, and the rejected matter was altered in character. He wasted considerably. At the autopsy the only disease detected was in the stomach and neighbouring glands, which form Museum Preparation No. 682. It is thus described:—"A stomach laid open to shew its walls thickened by a diffuse deposit of new growth, which occupies chiefly the submucous tissue and infiltrates the subjacent muscle. Upon the lesser curvature there is a large irregular ulcer with sharply defined edges. The organ is somewhat contracted, and its mucous membrane is smooth, the rugæ being completely obliterated. The neighbouring lymphatic glands contain secondary deposits." Histologically the growth is a cylindrical-celled carcinoma. *See Insp.*, vol. 8, p. 103.

CASE 5. *Carcinomatous infiltration and ulceration of the pyloric third of the stomach. Perforation of the stomach. Localised peritoneal abscess. Secondary deposits in peritoneum and lumbar glands. Abdominal tumour.*—Henry C., æt. 43, a coachman, of intemperate habits, became a patient of Dr. Stroud at the Northern Dispensary on September 22nd, 1829, suffering from abdominal disease, "evidently of long standing, but which had been increasing since the last six weeks." He was stated to have once had jaundice, and about a year ago to have vomited much blood. His symptoms were variable, severe pain in the abdomen and occasionally in the back, distressing flatulence, vomiting at times of an insipid liquid, and constipation with dark-green or nearly black motions. September 28th: After a slight apparent improvement, the patient was yesterday attacked by a severe lancinating pain in the hypochondria and scrobiculus cordis, extending towards the back. Dejections tinged with blood. October 26th: The abdominal pain has been occasionally severe, chiefly in the epigastrium, and latterly extending to the left shoulder. "On manual examination of the abdomen, with the assistance of Drs. Rogers and Bright, the muscles were found contracted and rigid and the integument above them loose; but no internal tumour could be distinctly perceived." On November 5th, abdominal pain less, but weakness and emaciation increasing. From this time the patient gradually "wasted and declined without pain," and on December 10th he died "tranquilly, being completely exhausted." Owing to his great emaciation a hard, irregular tumour could be distinctly felt at the scrobiculus cordis a little before his death. At the autopsy, "a pretty large, firm and defined tumour was felt in the epigastric region towards its lower part." The abdominal parietes were adherent over the tumour. The mesenteric glands were enlarged by malignant deposit, but the lumbar glands were more so, and together with the surrounding connective tissue, in which a similar adventitious structure was deposited, formed a dense solid mass, closely embracing the aorta and extending some inches on each side of it. There were no secondary deposits in the glands about the pancreas and the lesser curvature of the stomach. The liver contained several deposits and the spleen was embedded in adhesions. The pyloric third of the stomach presented externally a nodulated growth, and on opening the viscus, which was of small size, the internal surface at this part was found to be ulcerated for the space of three or four square inches, the margin of the ulcer being well defined and slightly elevated. About an inch from the pylorus there was a circular aperture in the wall of the stomach nearly large enough to admit the tip of one's finger, from which a passage led towards the concave surface of the liver. It opened into a cavity of considerable size, situated between the liver and the stomach, and extending as far as the convex surface of the spleen, where its dimensions were the largest and its contents the most considerable. It was perfectly circumscribed by adhesions, the internal surface, especially above the spleen, being soft, thick and vascular, and of a somewhat livid colour. The contents were of a dirty, puriform character, and of an offensive odour. The growth was "firm, with some translucence, and of a whitish colour, but there were numerous points of opaque and of a lightish yellow colour." There were a few secondary deposits on the peritoneum over the kidneys, and both pleural cavities contained serous fluid. See *Insp.*, vol. 9, p. 4.

CASE 6. *Carcinomatous stenosis of the pylorus and infiltration of the pyloric third of the stomach. Hour-glass contraction. Blood-stained contents. Secondary deposits in peritoneum. Visible peristalsis.*—William H. was admitted into Job ward for vomiting and constipation. He was said not to have passed anything through the bowels for five or six weeks before admission, and to have vomited upon every attempt to take food. Towards the end of his illness he became much emaciated and the vermicular motion of the "intestines" was very distinctly perceptible. A tumour was easily felt above the umbilicus and sometimes a little below it. Many remedies were exhibited, but he gradually sank about five weeks after admission "without having had at any time symptoms to encourage the efforts of the physician." At the autopsy a scirrhus deposit was felt in the situation of the pylorus, the peritoneum above it being ecchymosed. On opening the stomach the pyloric orifice was found to be so thickened as to barely permit the passage of a very small probe. The mesentery and omentum were studded with small scirrhus tubercles. The stomach was particularly contracted in the pyloric third. The cardiac portion was marked by a slight hour-glass contraction and was distended by a very dark, offensive, grumous fluid. The pylorus projected irregularly into the duodenum "somewhat like a fissured os uteri" and the muscular coat exhibited a translucent thickening from hypertrophy. The mucous membrane of the viscus was considerably thickened but free from ulceration. There were no secondary deposits in the liver or in the intestines. See *Insp.*, vol. 11, p. 136.

CASE 7. *Diffuse contracting carcinoma of the stomach (india-rubber bottle). Sero-purulent peritonitis. Enlarged spleen.*—William C., æt. 57, was admitted under Dr. Bright, in 1828, for dysentery. He also complained of pain situated midway between the umbilicus and scrobiculus cordis, with slight tenderness accompanied by nausea and other symptoms of gastric affection. The stools were deficient in bile with an occasional tinge of blood and purulent matter. He was under the impression that the food he took came up before it reached the stomach. He occasionally threw up some colourless fluid. An obscure and doubtful tumour was also felt about the region of the stomach. He died about five months after admission, and at the autopsy, the stomach (Prep. 699) was found to be "contracted to one-third of its usual size." Its walls were thickened throughout by a deposit of gelatinous material which was most abundant towards the pylorus, where the submucous tissue was half an inch in thickness. Upon the inner surface the growth appeared as small, translucent nodules, resembling boiled sago grains. Nodules of growth also projected beneath the thickened serous coat. Histologically the growth was a spheroidal-celled carcinoma with much colloid change and scanty stroma. The peritoneum contained a considerable quantity of sero-purulent fluid with recent deposits of lymph. There were old adhesions in the region of the liver, and the cavity of the gall-bladder and part of the cystic duct were quite obliterated, the former being represented by a white, fibrous structure. The hepatic duct was somewhat enlarged. The spleen was three times the normal size. There were no secondary deposits. See *Insp.*, vol. 14, p. 48, and *Prep.* 699.

CASE 8. *Carcinomatous stenosis of the pylorus. Dilated stomach. Secondary deposits in mesenteric glands and peritoneum. Movable abdominal tumour.*—

William R., æt. 45, was admitted under Dr. Black in 1832, with a hard, movable tumour in the pyloric region. He was unable to retain anything on his stomach, and his bowels were constipated. He was stated to have been "ailing with the like symptoms in a less degree for about five months." He suffered but little pain, and died fourteen days after admission. At the autopsy, the body was seen to be greatly emaciated, and a hard mass was distinctly felt on the right side, less movable than during life. The stomach was greatly distended, and contained a dark fluid. Its pyloric orifice was "so small from scirrhus thickening" as to admit with difficulty the little finger. The mesenteric glands were considerably enlarged, and there were numerous deposits of matter "deemed to be malignant" on the mesentery and omentum. The rest of the viscera were normal, except for old pleuritic adhesions, and œdema of the lungs. See *Insp.*, vol. 16, p. 168.

CASE 9. *Carcinomatous ulcer at pyloric end of stomach. Secondary deposits in liver, peritoneum and pleura, and in mesenteric glands. Ascites. Abdominal tumour.*—James S., æt. 34, was admitted under Dr. Bright, in 1835, for symptoms of malignant abdominal disease. For the last four or five months the patient has experienced pain in the abdomen, shooting round the navel and towards the back. During this time the bowels have been irregular, with griping and purging. He has been getting very thin, and his appetite falling off, so that for the last three or four weeks he has eaten scarcely anything. His present illness dates from about ten weeks ago, when he began to feel a hardness in the abdomen. At present there is a hard protrusion, about the size of a filbert, at the umbilicus, and some "lobulated nobs" between that and the scrobiculus cordis. The whole abdomen is hard and tender on pressure, particularly about the right hypochondrium. On the day after admission the patient had his bowels opened four or five times, the motions being well supplied with bile. Twelve days later there was effusion into the peritoneum. Twenty-five days after admission he died, and at the autopsy a large "fungoid ulcer" was found in the stomach, near the pylorus. The walls had undergone rapid softening, and the peritoneum was almost penetrated. There were numerous secondary deposits in the peritoneum and in the pleura. The liver was thickly beset within and without with malignant deposits about the size of nuts, and medullary in character. See *Insp.*, vol. 19, p. 160.

CASE 10. *Ulcerated carcinomatous tumour of pyloric end of stomach. Œdema of legs.*—William G., æt. 60, was admitted under Dr. Bright in 1835, with wasting and anasarca of the lower extremities, which had existed for five weeks. "He suffers from constipation, his bowels being open only once in three and sometimes in five days. He vomits occasionally, and has been losing flesh greatly. He has neither cough nor dyspnoea, but lies well on either side. The abdomen contains no fluid, but there is a distinct tumour to be felt immediately below the umbilicus of the size of a large orange, and likewise above the umbilicus to the left side a similar, but harder body." A few days after admission the upper tumour was much diminished, though not imperceptible, whilst the lower was as distinct as ever. The anasarca extended to the upper part of the thighs, the right being the more swollen. He died about six weeks after admission, and at the autopsy a tumour was found in the right end of the stomach, as large as an orange of moderate size.

On opening the organ lengthwise without cutting the tumour, it was seen to depend upon a large, circular, ulcerated growth of medullary character, about five inches in diameter, its edges raised and tending to eversion, its surface uneven and coarsely nodular. It had a hard and pretty even base towards the unaffected peritoneum. The pylorus, though close adjoining, was quite free, and a channel also from the left cardia, depending on a narrow tract of healthy mucous membrane, allowed the passage of food from the stomach to the intestine. The rest of the viscera were practically normal, the liver and peritoneum being free from secondary deposits.—*See Insp.*, vol. 20, p. 5.

CASE 11. *Carcinomatous ulcer and stenosis of pylorus. Secondary deposits in the liver, spleen and pleura. Caseating tubercle in gastric lymphatic glands.*—Susan V., æt. 45 (but probably older, as the body is stated to be that of an “aged, edentulous, greatly attenuated female”) was admitted under Dr. Bright on December the 16th, 1835, and died February 27th, 1836. She is related to have begun to suffer from loss of appetite and weakness three months before admission, and for the last three weeks to have vomited, the vomiting being latterly very constant after taking food. There is a small tumour indistinctly felt on the right of the umbilicus. On January 22nd a note is made that no motion has been passed for the last week, and that she vomits twice or thrice a day. The vomited matter is black. On the 30th “no stools for many days.” On February 5th a tumour was felt at the pit of the stomach, which was movable from side to side, and on the left there was a small glandular body. At the autopsy, the abdominal parietes were so drawn in upon the reduced cavity, and so firmly contracted, that no tumour could be felt. The stomach showed in its pyloric part an ulcer about two inches in diameter. Towards the pylorus the base of the ulcer is smooth and exposes the muscular coat, while towards the body of the organ it is infiltrated with growth, and the edge is raised and everted. There is considerable thickening of the walls, narrowing the pyloric orifice. Adherent to the organ are several lymphatic glands, which are much enlarged and caseous. Histologically the wall of the stomach is infiltrated with cylindrical-celled carcinoma, and the glands contain a deposit of caseating tubercle. There were secondary deposits beneath the pleura, and in the liver and spleen. The greater part of the left lung was in a state of hypostatic pneumonia. *See Insp.*, vol. 21, p. 135, and *Prep.* 686.

CASE 12. *Carcinomatous infiltration of the lesser curvature of the stomach. Ulceration of mucous membrane. Adhesion to pancreas. Dilatation of pancreatic ducts. Jaundice and hæmatemesis. Peritonitis.*—James B., æt. 61, was admitted under Dr. Bright, in 1836, with jaundice and hæmatemesis. Seventeen days later he died, and at the autopsy a “scirrhus thickening of the coats of the stomach occupied the greater part of the lesser curvature, rendering them in the centre of the wide patch more than twice their usual thickness.” The serous surface was occupied by dense adhesions and the mucous membrane presented wide flattened granules of altered membrane with some superficial ulceration. The stomach and intestines were filled with loose clotted blood. The pancreatic ducts were generally dilated and the gland itself was adherent to the diseased portion of the stomach. The kidneys were of good size, granular and tinged with bile. The gall-bladder, which was large, was filled with a mucous or muco-purulent secretion. There was

general peritonitis though little capillary injection remained. The liver was deeply tinged with bile, and somewhat nutmegged. The ductus communis choledochus was dilated and the opening of the duct into the duodenum narrow. There were no secondary deposits. See *Insp.*, vol. 22, p. 55.

CASE 13. *Carcinomatous stenosis of the pylorus and infiltration of the pyloric half of the stomach. Secondary deposits in liver, omentum and mesenteric glands. Pleuritic effusion. Dyspeptic symptoms for seven years before death.*—Mr. W., æt. 47, was admitted for vomiting and pain in the stomach and back. He was of a sallow complexion and of a varying spirit. It is stated that he had formerly been stout, powerful and a free feeder, closely and carefully attentive to his business, which was that of a chemist, on which account his breakfast and supper were his fullest meals. Seven or eight years ago he felt uneasiness in his stomach, with dyspeptic symptoms. For four or five years his health had declined, and for eight or nine months more visibly. At the autopsy the body was extremely emaciated and dry, and had a slight yellowish tint. The liver contained numerous secondary deposits. The right anterior margin of the stomach was marked by a band of light granular fungoid matter within the omentum, about three inches in length and nearly an inch broad towards the right, but tapering away towards the left of the organ. The duodenum was free and the pancreas also, though surrounded by pale-coloured tubercles. The ducts presented no obvious cause of obstruction. The pylorus was thickened and its aperture would barely admit the handle of a scalpel. The general coats of the stomach immediately adjoining were both thickened and indurated. The lining to a considerable extent about the pylorus and along the course of the smaller curvature was affected with a malignant ulceration, being thickened, granular, firm and whitish in a pretty uniform degree. The thickness was rather more considerable near the pylorus, but the most was scarcely so much as two lines. This, as it were, superficial degeneration or fungation was very well defined; parts were a little excoriated and others injected. The stomach was greatly dilated towards the left, full of gas and ingesta. The under half of it in contact with fluid was marked by much post-mortem digestion. Some mesenteric glands were enlarged and firm, the rest seeming healthy. The left pleura contained about half a pint of serum and two or three flakes of opaque lymph. See *Insp.*, vol. 23, page 79.

CASE 14. *Carcinomatous infiltration of the pyloric end of the stomach. Secondary deposits in mesenteric glands, liver, peritoneum and pleura. Carcinomatous contraction of ileum. Pleural effusion.*—Charles A., æt. 35, was admitted in 1839, under Dr. Addison, with signs of gastric disease. Ten days later he died, and at the autopsy the free surface of the peritoneum was found in most places to be affected with small tumours of a malignant nature, these being most numerous on the portion forming the mesentery and that covering the fundus of the urinary bladder. The liver was much congested, and also contained some small secondary deposits. The walls of the stomach near the pylorus were nearly half an inch in thickness, and indurated from malignant disease, and the mucous membrane of the stomach was of a reddish colour from increased vascularity. The mesenteric glands were much enlarged, and also the diaphragm much thickened, so that this in some places measured nearly an inch in thickness. Near the end of the ileum, on

its peritoneal surface, there were several small malignant tumours surrounding the intestine and forming a stricture, which nearly occluded the canal, but the mucous membrane of the large and small intestine was healthy. The right pleural cavity contained about twenty ounces of straw-coloured serum. The free surface of this membrane was almost everywhere affected by malignant tumours, which varied in size from that of a pea to that of a common nut. The left pleura contained only about eight ounces of serum, but this membrane, like the right, had small malignant tumours deposited on it everywhere; but these were more numerous and of larger size upon the portion lining the ribs and diaphragm than elsewhere. Both lungs were compressed. *See Insp.*, vol. 29, p. 57.

CASE 15. *Ulcerated soft carcinomatous tumours at pyloric end of stomach. Miliary carcinoma of peritoneum. Adhesion of stomach to liver. Secondary deposits in liver.*—Thomas C., was admitted under Mr. Aston Key, in 1839, with symptoms of malignant disease of the stomach, and died fifteen days later. At the autopsy the peritoneum was in most places affected with small malignant tumours which varied in size from that of a pea to that of a common nut. They were more numerous on portions lining the peritoneum of the pelvis than elsewhere. The portions of the peritoneum covering the liver were firmly adherent to both the abdominal parietes and the stomach. The structure of the liver was in most places affected with small scirrhous tumours of rounded form, soft in texture and white in appearance. The mucous membrane of the stomach was in most places much increased in vascularity, but near the pylorus there was a flat tumour (cerebriform cancer) equal in circumference to a half-crown piece and about twice as thick. The mucous membrane covering this tumour was destroyed. The spleen was diminished in size and fleshy. Both kidneys were their healthy size with somewhat indurated structure. The mucous membrane of the rest of the alimentary canal was normal. Both lungs were uniformly adherent by old adhesions to the costal pleura. There were also a few tubercles in different parts of their structure. The bronchial tubes contained viscid mucus, and their mucous membrane was somewhat congested with blood. *See Insp.*, vol. 29, p. 75.

CASE 16. *Cancerous ulceration and diffuse infiltration of the stomach. Adhesion to liver. Perforation of ulcer. General suppurative peritonitis. Gastro-duodenal fistula. Pancreas invaded by growth. Deposits in mesenteric glands.*—George C., æt. 51, was admitted to Job ward, under Dr. Addison, in 1840, suffering from symptoms of gastric disease. He was admitted on the 15th of January, and he died on the 3rd of March. At the autopsy the peritoneum contained about two pints of opaque serum mixed with large quantities of coagulated lymph. The peritoneum was in most places inflamed, so that its free surface was nearly everywhere besmeared with thin layers of recently effused lymph, which had in several places deeply united together the convolutions of intestine. The liver was of large size, firmly adherent to the diaphragm by cellular membrane, and its surface had a pale white appearance, covered in several places by minute congested blood-vessels. Its structure contained no fat. The gall-bladder contained about two ounces of healthy bile. Kidneys of large size. Mesenteric glands enlarged and inflamed. The stomach was much contracted, the external

surface adherent to the diaphragm, and its walls much thickened by malignant disease. About three inches from the pylorus the coats of the stomach were destroyed by a malignant ulcer equal in size to the palm of the hand, presenting a very ragged appearance. A portion of the wall of this ulcer was formed by the concave surface of the left lobe of the liver, and close to the centre of the ulcer there was a hole, which would admit the end of a man's little finger, through the stomach into the cavity of the peritoneum. About one inch from the latter hole there was another opening from the stomach into the duodenum, so that a probe could be passed from the former into the latter. The head of the pancreas was forming a part of the wall of the ulcer in the stomach. The structure of the pancreas was everywhere changed by malignant disease, this having extended from the stomach, yet the pancreas was only slightly enlarged, but its duct was nearly impervious. The mucous membrane of the rest of the alimentary canal was healthy. See *Insp.*, vol. 30, p. 92.

CASE 17. *Diffuse carcinoma of the stomach and lower end of œsophagus. Secondary deposits in peritoneum and chronic peritonitis with ascites. Secondary deposits in mesenteric glands and liver. Pleural effusion.*—George P., æt. 55, was admitted in 1840, under Dr. Back, on the 26th of May, and died on the 15th of July. It is stated that he had been ill for three weeks with dyspepsia and pyrosis. He was also the subject of a direct inguinal hernia and had ascites. Shortly after his admission, on June the 30th, he was tapped through the hernial sac, about a pailful of fluid being drawn off. At the autopsy the coats of the stomach were found to be thickened to the extent of half an inch. The coats of the lower end of the œsophagus were also very thick. The lymphatic glands of the lesser curvature of the stomach were enlarged with malignant disease. The lower end of the œsophagus was also surrounded by smaller diseased glands. Glisson's capsule contained a large mass of malignant disease surrounding the vessels. There were a few small diseased glands along the greater curvature, and the mesenteric and lumbar glands were also enlarged. The peritoneal cavity contained more than a gallon of clear yellow serum. The parietal peritoneum of the pelvis was studded with small tubercles, the omentum shortened, thickened and corrugated. The liver contained a malignant tumour the size of a large orange, and passing slightly into the left lobe it pressed upon the termination of the hepatic veins, which were much dilated. The spleen was firm and healthy. The kidneys small and healthy. Heart also healthy. The body was much emaciated, and the left pleural cavity contained about a pint and a half of serum; the right about a pint. The left lung was perfectly healthy, the pleura being slightly adherent at its apex. There was a little emphysema at the anterior part of the right lung. See *Insp.*, vol. 30, p. 186.

CASE 18. *Carcinomatous ulceration of pyloric end of stomach. Blood-stained gastric contents. Peritoneal adhesions. Secondary deposits in the liver.*—William C., was admitted under Dr. Babington in 1841, being admitted on the 25th of August and dying on the 5th of October. He was a labourer, thin and pale, and of a "malignant" aspect. Ten weeks before admission he was taken with purging and sickness, which continued for a month. The sickness invariably occurred about an hour after taking food, and at the same time he had violent and almost constant pain in the

epigastrium which increased, however, after taking his meals. He has had a cough ever since he was first taken ill, which occasioned him much pain by shaking him. The tongue was furred at the edges and in the centre. The skin cool. Pulse feeble, about 70. Much emaciation. At the autopsy, a large quantity of blackish, grimy fluid was found in the stomach, the left end of which had undergone digestion. There were a few adhesions, old and filmy, at different parts about the pylorus, and inside the stomach were three or four dirty, sloughy ulcers, as large as a crown piece, towards the pylorus but more or less confluent or united. The liver contained half-a-dozen round tubercles, the size of large beans. The pancreas was somewhat indurated and contracted, and its duct seemed too large. *See Insp.*, vol. 31, p. 155.

CASE 19. *Carcinoma of stomach secondary to primary disease of the uterus. Secondary deposits also in lumbar glands and in the liver, peritoneum and lungs. Growth of uterus implicating bladder and causing hydronephrosis.*—Elizabeth C., was admitted under Dr. Addison, in 1842, having long suffered with malignant disease of the os of the cervix uteri. At the autopsy, the lumbar glands were diseased, and the pelvis of the kidneys dilated. The stomach was found to present towards the pylorus a malignant tumour about the size of a walnut which seemed to implicate the whole of the muscular tissue, leaving the mucous membrane healthy. The pyloric valve was not encroached upon. The liver, which showed considerable contraction of its peritoneal investment, contained a few scirrhous masses the size of a walnut to double that size. There were secondary deposits in the peritoneum and in the mesenteric glands. The kidneys were small, hard and pale, and their pelvises were considerably dilated. The ureters were distended, their openings into the bladder being partially obstructed by the disease of the uterus, which had implicated the posterior part of the bladder and produced perforation. The aorta was rough. The common iliac veins and the vena cava were greatly obstructed by laminated coagulum, in many places firmly adherent to their lining membranes. The lumbar glands were hard and disorganised by scirrhus. The pleuræ were adherent. The lungs contained some secondary deposits. *See Insp.*, vol. 32, p. 11.

CASE 20. *Carcinomatous ulcer of pylorus. Dilated stomach. Phthisis at the apex of the right lung.*—John L. was admitted under Dr. Barlow in 1843, on the 1st of March, and died on the 6th of July. At the autopsy, the stomach was greatly distended with acid water, the left end evidently pitted by post-mortem digestion. The pyloric muscle, coarse and very hard, and the last inch and a half of lining of the stomach presented a white, flattish ulcer, with partially fungating edges. The growth was examined in 1891, and reported to be a spheroidal carcinoma. There was a strumous gland and some induration and thickening at the pylorus. The pleuræ were adherent and contained tubercles, and there was tuberculous excavation at the apex of the right lung. The posterior lobes were oedematous. The kidneys were coarse and congested. The rest of the viscera, so far as examined, were normal. *See Insp.*, vol. 32, p. 215.

CASE 21. *Carcinoma of the body of the stomach. Gangrene of cæcum. Peritonitis.*—Thomas S., æt. 55, was admitted under Dr. Barlow, in 1844, with gastric symptoms and occasional vomiting. He was stated to have been ill nine days, and he died eleven days after admission. At the autopsy, there was general peritonitis, which was thought to have arisen from a gangrenous patch in the cæcum. There were also two small aneurysms in the aorta. The stomach was very small, and the inch and a half of the pyloric end was healthy. The rest of the organ was occupied by uniform scirrhus thickening of all the coats half an inch thick, including nearly all the left end. The œsophagus was healthy. There were no secondary deposits, but the pleura is said to have been sprinkled with hard, whitish, irregular tubercles, very old, which may perhaps have been of malignant nature. See *Insp.*, vol. 33, p. 46.

CASE 22. *Carcinoma of stomach secondary to chronic simple ulcer (?). Secondary deposits in liver. Hæmatemesis.*—Robert R., æt. 28, was admitted under Dr. Addison, in 1845, having previously been a patient in St. Thomas's Hospital for some months, suffering, as was thought, from diseased liver. He died about three months from the onset of his symptoms, having six hours before death vomited about a pint of dark clotted blood. At the autopsy, the left end of the stomach was found to present on its posterior surface a mass of malignant deposit described as being the size of a spleen. At the centre of the malignant disease was an ulcer the size of a small palm, deep, with inverted edges and black sloughy surface. The coats were infiltrated by malignant deposit. There were also secondary deposits in the liver. See *Insp.*, vol. 33, p. 80.

CASE 23. *Deep ulcer on posterior wall of stomach. Carcinomatous deposit in edges of ulcer. Hypertrophied pylorus. Dilated stomach.*—Sarah C., æt. 35, was admitted under Dr. Barlow in 1845, with a sloughing and gangrenous condition of the mouth, due to mercury. She had been ill nine months, and died about a month after admission. At the autopsy, the muscle of the stomach at the pylorus was found to be considerably thickened, and on the posterior surface of the organ was a wide, deep ulcer, the edges of which were affected by carcinomatous deposit. The base of the ulcer was formed of indurated tissues and the exposed pancreas. The stomach itself was greatly distended with air and water. There were no secondary deposits. See *Insp.*, vol. 33, p. 174.

CASE 24. *General carcinomatous infiltration of the stomach. Secondary deposits in liver, ovary and lymphatic glands.*—In this case the name and age of the patient are not given, nor is there any clinical account of the case. It is stated that the stomach was fully half an inch in thickness and that it was generally infiltrated by malignant deposit. The liver contained numerous small firm encephaloid deposits, and there appear to have been some deposits around the pancreas. One ovary was as large as an orange and was filled with a firm carcinomatous growth. See *Insp.*, vol. 34, p. 58.

CASE 25. *Carcinoma of the pylorus and body of the stomach. Colitis. Secondary deposits in kidney.*—Sarah B., æt. 53, was admitted in 1846 with general pain over the abdomen, which was much increased by pressure. The

abdomen was swollen; the bowels had not been open for five days, and there was constant vomiting of coffee-ground material. She was a woman of middle stature, married, and subject to constipated bowels; she was much emaciated. A month before admission she felt pain all over the abdomen, which lasted for three days, during which time the bowels were not relieved. These symptoms disappeared till a fortnight ago, the bowels then failed to act for six or seven days and vomiting soon afterwards came on, the stomach rejecting everything. She died nineteen days after admission, the diagnosis being stated to have remained doubtful till the end. At the autopsy, the stomach was found much contracted and the pylorus was considerably thickened, the coats being compared to fibro-cartilage. The mucous membrane itself was of a dark brown colour, was ecchymosed and presented small round thickenings and abrasions. At the part contiguous to the pancreas there were small white opaque granules—"malignant tubercles." The pancreas was hard and firm and adherent to the lesser curvature. The right extremity was healthy, the left was hard and indurated but otherwise natural. The lungs were healthy and the spleen also. The large intestine was in a condition of colitis, the mucous membrane being indurated, dark, ecchymosed, and in parts ulcerated. The kidneys were pale and contained "tubercles," they weighed nine ounces. *See Insp.* 34, p. 156.

CASE 26. *Carcinoma of lesser curvature of stomach. Perforation of wall. General peritonitis. Secondary deposits in liver and abdominal lymphatic glands.*—Henry P., æt. 65, was admitted in 1848, under Dr. Barlow, and died about a month later. At the autopsy, the stomach was found to present at its lesser curvature a mass of carcinoma. In this mass ulceration had taken place, and perforation. There was general peritonitis. The liver was filled with carcinomatous deposits. All the lumbar and abdominal lymphatic glands were in a state of carcinoma, that is, all the glands below the diaphragm. No other lymphatic glands were found to be affected. The hepatic duct was normal, the lobulus spigelii contained much carcinoma. The lungs presented numerous hard minute bodies, surrounded by black matter, probably not of carcinomatous origin. *See Insp.*, vol. 35, p. 358.

CASE 27. *Carcinomatous infiltration and contraction of the stomach. Great hypertrophy of muscular coat. Secondary deposits in omenta and lymphatic glands.*—Elizabeth T., æt. 37, was admitted under Dr. Babington in 1850, coming in on July 17th and dying on August 4th. At the autopsy, the thoracic viscera were normal. The stomach was contracted and was almost as hard as wood, like the thickest leather. The muscular coat was extraordinarily developed, and the submucous cellular tissue was changed into a thick, opaque mass. The mucous lining was red, rugose and elevated in parts, and when the mucus was detached, there appeared to be small jelly-like looking points not much larger than millet seeds. The alimentary canal was normal as far as the ascending colon, at which point the bowel was contracted and the muscular coat very thick. The cæcum was distended with gas. The small and large omenta were corrugated, and a few lymphatic glands above the stomach were enlarged but not very hard. The muscular coat of the pylorus was not much thickened. Both ovaries contained small cysts of a simple character. *See Insp.*, vol. 36, p. 177.

CASE 28. *Carcinoma of anterior wall of stomach. Perforation of stomach. General peritonitis. Secondary deposits in lumbar glands and in kidneys. Cirrhosis of liver. Tubercle of lung.*—Michael C. was admitted under Dr. Barlow in 1851. At the autopsy, general peritonitis was found, and the wall of the abdomen was adherent to a malignant mass in the walls of the stomach. The pyloric valve not implicated. Mucous membrane of stomach perforated in several places. The liver was hobnailed, with thickened edges, and much congested. The kidneys were granular upon the surface and studded with malignant tubercles. The lumbar glands were also infiltrated with malignant disease. There were old adhesions of the pleura, the pericardium was also adherent and the upper lobes of both lungs were affected by tuberculous disease. See *Insp.*, vol. 36, p. 295.

CASE 29. *Carcinoma of the lesser curvature of the stomach. Secondary deposits in glands causing obstruction of common bile duct. Jaundice.*—George H., æt. 42, was admitted under Dr. Owen Rees, in 1853, coming in on March 9th and dying on April 17th. At the autopsy, the body was greatly emaciated and was of a bright yellow colour from jaundice. The organs of the chest were healthy, the small intestine shrunken and empty, the large intestine contained abundance of leaden-coloured matter. The stomach contained a quantity of ill-digested food, orange-pips, etc. The lesser curvature as far as the pylorus was the seat of a cerebriform fungus sprouting up and forming a considerable growth, on either side of which were some malignant ulcers. The coats of the stomach were much thickened and infiltrated with cancerous matter. The glands external to the stomach were infiltrated with cancer, and by their enlargement encircled the common duct and produced complete occlusion of it. These glands surrounded the head of the pancreas in every direction so that at first sight the pancreas seemed to be the subject of cancerous disease; but it was not so. The glands being dissected off left the head of the pancreas perfectly intact. The effect of the obstruction of the common duct was seen in the great dilatation of the hepatic ducts, into many of which the little finger could be passed. The gall-bladder was wasted and empty from the occlusion of the cystic duct. The lumbar glands were infiltrated with malignant matter. The kidneys were large but healthy. See *Insp.*, vol. 37, p. 89.

CASE 30. *Colloid carcinoma of pylorus and lesser curvature of the stomach. Secondary deposits in ovary and lymphatic glands. Abdominal tumour. Pigmentation of skin.*—Elizabeth L., æt. 53, was admitted under Dr. Babington, in 1853, on March 30th, and died on April 2nd. She was a single woman and a servant, living in Trinity Square. Her previous health was good. On admission, she was very thin, gray and withered. While under treatment for some skin disease about three months ago, her present symptom, vomiting, commenced. No pain, but gradual wasting and vomiting every two or three days. The abdomen was rigid, and a tumour was felt above the umbilicus. At the autopsy a peculiar discoloration of the skin was noticed, there being on either side of the neck a tawny appearance, which would not have been remarked had it not been for three still more marked tawny patches, one on the centre of the sternum and the other two under each axilla. The skin also, besides presenting this yellowy-brown appearance, was somewhat raised and wrinkled. At the autopsy, the walls of

the stomach at the pylorus and throughout the lesser curvature were thickened. The out surface of the thickened wall presented externally a peculiar net-work appearance, containing a transparent stroma; beneath this another layer with fibres of strong cellular membrane longitudinally arranged. Within this the mucous membrane for the most part whole and intact. The whole thickness of the growth was about three-quarters of an inch at the pylorus, gradually tapering away to a quarter of an inch at the commencement of the cardia. The mucous membrane, however, was here and there destroyed by ulceration, which extended in one instance to the depth of a quarter of an inch. Dr. Wilks remarks that this was gelatiniform cancer of the stomach, and that there was soft cancer of the neighbouring glands. The stomach was contracted and empty. Externally to the stomach several of the glands were adherent to the head of the pancreas. Several of the lumbar glands were enlarged and closely adherent to the kidneys. The kidneys, liver, pancreas and spleen were healthy. The uterus contained fibroid tumours, and there was a secondary deposit in the left ovary. *See Insp.*, vol. 37, p. 105.

CASE 31. *Colloid carcinoma of the lesser curvature and anterior surface of the stomach. Infiltration of the great omentum, diaphragm and pleura. Secondary deposits in peritoneum and in mediastinal glands. Hæmorrhagic pleural effusion.*—John C., æt. 47, was admitted under Dr. Barlow, in 1853, for vomiting, constipation and gradual emaciation. A month before admission he had begun to suffer pain at the scrobiculus cordis, and up to this time he had presented no symptoms of disease. He died about six weeks after admission, and at the autopsy, the omentum was found to be contracted into a thick, yellowish mass, about half an inch in breadth, which projected towards the abdominal parietes, and resembled to the touch the margin of the liver. The margin of the liver itself was irregular and notched, and situated immediately above the transverse colon. The surface of the liver was roughened by small gelatinous tubercles, and a thick layer of similar tubercles covered the whole under surface of the diaphragm, the diaphragm at this part being much thickened and the pleural surface invaded. There were numerous gelatinous masses scattered throughout the peritoneum. The stomach had a small cavity and thick parietes. At the lesser curvature, from the œsophagus to the pylorus, the mucous membrane was irregularly raised, and presented an appearance of cells distended with fluid. The larger curvature was healthy. The stomach is preserved in the museum, and forms Preparation No. 693, being thus described: "A stomach from which the posterior wall has been removed, to show an infiltrating growth involving the lesser curvature throughout its length, and extending along the anterior surface of the organ, almost as far as the greater curvature." The pleura contained about half a pint of bloody serum on either side. The posterior lobes of the lungs were congested, and there were signs of healed phthisis at the apex of the left lung. In the anterior mediastinum, over the lower part of the pericardium in contact with the diaphragm was a thickened gland about the size of a hazel nut. The pericardium was healthy. The heart weighed six and a half ounces, and was destitute of fat. *See Insp.*, vol. 37, p. 116; *Guy's Hospital Reports*, 1855, p. 127; and *Prep.* 693.

CASE 32. *Carcinomatous plaque in greater curvature of stomach. Fibrous thickening (†carcinomatous) of pylorus. Pigmentation of skin. Thrombosis*

of veins of leg.—Griffith G., *æt.* 62, was admitted under Dr. Hughes on April 19th, 1854, for œdema, weakness, and considerable pigmentation of the skin, suggesting the presence of Addison's disease. When about nineteen years of age he passed bloody stools, and for the last twenty years has suffered from hæmorrhoids, losing at times a considerable quantity of blood. Four months ago he was seized with a violent pain in the right leg, running from his thigh to his foot; shortly afterwards the leg began to swell, and he had great pain in the region of the stomach. On admission, the urine was found to be free from albumen. April 22nd: Diarrhœa, from which he continued to suffer until his death on May 27th. At the autopsy, the body was found much emaciated and the skin discoloured and of a dingy colour; the supra-renal capsules were normal. The stomach and viscera were much contracted, and the mucous membrane of the former was thickened at the greater curvature over a space of about two inches in circumference. It was a little puckered at the margin, and the upper border of this patch presented a small growth consisting of thickened prominent mucous membrane. Histological examination of the raised portion of the mucous membrane of the stomach showed it to consist of columnar epithelium on the surface and beneath of cells with large nuclei. The more prominent portion contained cells with obstructed and enlarged gastric follicles. The pylorus was much thickened and consisted of dense fibrous tissue passing between bundles of involuntary muscular fibre. There was follicular ulceration of the cæcum and colon with fatty degeneration of the heart. There were no secondary deposits in any organ or in the peritoneum. See *Insp.*, 1854, No. 112.

CASE 33. *Carcinoma of pylorus and lesser curvature of stomach. Secondary deposits in mesenteric glands. Movable abdominal tumour.*—Thomas G., *æt.* 62, was admitted under Dr. Hughes with wasting, slight œdema of the ankles and occasional vomiting. He is said to have suffered for the preceding eight months from flatulence, loss of appetite, and dyspeptic symptoms, but to have been seriously ill only during the six weeks before admission. There has been no hæmatemesis, and the patient had no actual pain, but merely uneasiness at the pit of the stomach. On admission, a tumour of the size of an orange or larger was to be felt at the umbilicus and a little above it. The tumour was slightly movable, "and this together with the symptoms warranted the diagnosis of cancer in the region of the pylorus." The patient died eighteen days after admission, and at the autopsy, a mass of growth was seen occupying the situation of the pyloric end of the stomach. This lay a little to the right of the median line, and just above the umbilicus. The diseased portion was white, smooth on the surface and not adherent to the parietal peritoneum. The transverse colon ran along its lower edge and was also closely united to it by fibrous adhesions. The bowel, however, was not affected by the cancer. The gall-bladder and liver were attached to the stomach by easily separable adhesions, the deposit being thus seen to be confined to that viscus and the neighbouring lymphatic glands. On opening the organ the principal focus of the disease was found at the pylorus, this part being occupied by a mass of soft cancer as large as a swan's egg. The growth encircled the aperture equally so that a section of the diseased wall had a diameter at its thickest part of about an inch and a half. The morbid structure was of an equal depth on each side of the muscular coat, for remains of this tissue could be seen in places in the midst of the cancerous mass. It

ended at the pylorus in a thick villous margin of very vascular character, extending from the ring about two or three inches within the stomach where it terminated in a similar villous border. The mucous membrane was not at this part ulcerated, and the channel of the pylorus would admit the passage of the little finger. In the lesser curvature of the stomach was another soft, cancerous mass resting upon the pancreas and projecting as a rounded tumour the size of an egg into the stomach. This was united with the pyloric tumour. In connection also with this second growth was another still smaller on the posterior surface of the stomach. The mucous membrane over these latter portions was slightly abraded. The stomach was of moderate size, rather under than over the usual capacity. It contained no fluid but hard masses of egg and orange. Closely adherent to the stomach were a few glands infiltrated with malignant deposit. The pancreas was perfectly untouched, as also were the liver and spleen. Intestines healthy. The kidneys, which weighed five and a half ounces, were very granular. See *Insp.*, 1855, No. 12.

CASE 34. *Sloughing carcinomatous tumour of the pylorus. No obstruction. Gastro-colic fistula. Secondary growth in cæcum. Thrombosis of aorta and vena cava. Abdominal tumour.*—John E., æt. 67, was admitted under Dr. Hughes, very emaciated and feeble, and presenting an obscure tumour in the scrobiculus cordis. He was a labourer, living at Greenwich, and his present illness began twelve months before admission with symptoms of indigestion. These increased, and he occasionally suffered great pain at the pit of the stomach and on the left side. The tumour in the scrobiculus cordis was not well defined. During his stay in the hospital he suffered much distress and uneasiness upon eating, and therefore would take but little solid food and small quantities to drink. He was understood to say that he had not been troubled with sickness and no vomiting occurred during the time that he was in the hospital. The urine was not albuminous. He gradually sank and died five weeks after admission. Seven days before he died the legs became slightly swollen and a few purpuric patches appeared on the backs of the hands and of the forearms. On opening the abdomen, the ill-defined tumour felt during life was seen to be due to a mass of disease in the neighbourhood of the pylorus. A large, hard tumour occupying this end of the stomach could now be grasped by the hand. It was quite movable, being only connected behind to the head of the pancreas, and quite free from the liver. It formed, however, a close adhesion to the transverse colon in front of it. On removing the stomach, the disease was seen to be confined to that organ. The stomach was opened along the lesser curvature, but before doing so the finger was introduced into the pylorus to examine the passage. It passed readily on, though surrounded by disease. The interior presented at the pyloric end a large, raised, fungating, carcinomatous growth about the size of the palm of the hand. The surface was sloughing, but no blood was discoverable. Its edges were raised in some places to nearly an inch above the level of the mucous membrane. These edges were firm and rounded, and projected straight into the stomach. The valve of the pylorus formed the outer boundary. This was red, and appeared very vascular. Near the main mass, but quite detached, there were two small isolated growths of a similar formation beneath the mucous membrane. The

muscular coat of the pylorus was much thickened. There was a communication between the stomach and colon large enough to admit a crow quill. The growth was examined histologically in 1891, and found to be a spheroidal carcinoma with scanty stroma. The cæcum contained similar disease to that of the stomach, but in an earlier stage. On the outer surface were two or three hard tubercles, and the mucous membrane presented a slightly ulcerated surface. The edges of the valve were raised, hardened and rounded from cancerous infiltration; a few isolated cancerous tubercles were seen beneath the neighbouring mucous membrane. The microscope did not show such characteristic elements of carcinoma in the cæcal growth, but its outward appearance resembled that of growth in the stomach. The abdominal aorta immediately above the bifurcation contained an ante-mortem clot about two inches long; it was partly adherent and hollow. The interior was soft. The vena cava and the iliac veins were full of similar ante-mortem clot. About half a pint of serum was found on each side of the chest, and there was extensive tuberculous disease of the lungs. The kidneys were slightly granular. *See Insp.*, 1855, No. 170.

CASE 35. *Carcinomatous stenosis of the pylorus. Hypertrophy and dilatation of stomach. Chronic ulcer of mucous membrane. Secondary deposits in lymphatic glands. Perforation of rectum by enema-tube. General surgical emphysema.*—Joseph B., æt. 50, was admitted under Dr. Hughes with weakness, wasting, and abdominal distension. He was admitted on May 14th and died on July 16th. He stated that four months ago his present illness began with pain in the chest and abdomen, and occasional sickness. Soon afterwards he had constant vomiting of food. On admission, he was seen to be wasted, and had frequent vomiting; the abdomen was distended and tender; urine healthy; no tumour to be felt. He was thought to be suffering from malignant disease. He continued wasting and had occasional vomiting, when on June 10th an enema was ordered him. Wishing to administer it himself he introduced in the evening the clyster-pipe and immediately experienced great pain in the part, succeeded by distension of the abdomen. On the following day Dr. Hughes in his rounds found the whole of the lower part of the body emphysematous. This continued and gradually increased upwards. At the end of June the air was becoming absorbed and the man seemed altogether better. After this he sank again to a very low condition and gradually died. At the autopsy, when the abdomen was opened, nothing remarkable presented itself, but the intestines were rather contracted and the stomach considerably dilated, reaching much below its usual position. On lifting up the latter the pyloric end was seen to be enlarged, forming a distinct tumour. Around this were a number of enlarged lymphatic glands; these had formed no adhesions to the stomach, and thus no tumour existed which could have been felt through the walls of the abdomen. The stomach on removal was found to be considerably enlarged and the walls were very much thickened. This hypertrophy existed principally towards the pyloric end, where the muscular coat was seen to be about twice its natural thickness. The pylorus was much narrowed, so that only the point of the little finger could be introduced within it. Upon cutting this through the walls were seen to be about half an inch thick, not only from the hypertrophy of the muscular coats, but from a carcinomatous deposit in the mucous membrane and below it. The material

was white, emitted a juice, and was evidently cancerous. The mucous membrane was occupied by a round ulcer, the size of a sixpenny-piece, with raised edges. The gastric lymphatic glands around and behind were much enlarged by cancer, the head of the pancreas was also surrounded by similar diseased glands, but the organ itself was quite healthy. The bowel was quite healthy, excepting the rectum. This at the lower part was much distended, quite filling the pelvis laterally. Upon opening it nearly the whole inner surface was seen occupied by a large ulcer. This ulcer extended upwards from the anus four inches and from side to side three inches, leaving only a narrow strip of mucous membrane, about an inch in width, at the upper part. The edges were raised and vascular, the base of the ulcer was ragged and composed of strings of muscular coat running across it. Between these were hollow spaces, one of which passed backwards and formed a pouch; beneath one a thick band of muscular fibres, with a round opening which passed into the cellular tissue and the retro-peritoneal space. It was probably here that the injection-pipe entered and caused the emphysema. (See Museum Prep. 984.) The liver was free from secondary deposits, the spleen was healthy, the kidneys were affected by chronic interstitial nephritis, weighing six ounces. The lungs presented the condition of hypostatic pneumonia. See *Insp.*, 1856, No. 130.

CASE 36. *Carcinoma of pyloric end of the stomach. ? Secondary to simple ulcer. Secondary deposits in peritoneum and lymphatic glands.*—James T., æt. 46, was admitted under Dr. Addison with gastric symptoms and died twelve days later. He was a silk-weaver, which occupation he had followed for thirty-four years. His employment necessitated constant pressure at the pit of the stomach. He was said to have been sober. Five years before admission he suffered from severe gastric symptoms—vomiting, pain, etc., attended with general wasting. He perfectly recovered for some months but since then he has had occasional dyspeptic attacks. Six months ago all the symptoms became aggravated: vomiting after every meal, sometimes at short intervals, though often only after some hours; also severe gastric pains. Nothing definite could be felt in the abdomen, but it was clear from the symptoms that he was suffering from cancer of the stomach, and this probably at the pylorus. At the autopsy, the body was found to be much wasted but no tumour could be felt through the abdominal wall. There were a few cancerous nodules in the peritoneum scattered in the neighbourhood of the stomach. The seat of the disease was seen to be at the pylorus, where from cancerous deposit and inflammation a thickening had taken place. The contracted colon with the omentum was firmly adherent to the lesser end of the stomach and duodenum. When this was removed the disease was seen to be limited to the pylorus and the absorbent glands around. It was then found that the contraction was not actually at the pylorus but about an inch and a half above it; and this was not so much due to the deposition of new material as to a fold in the stomach at this part having formed a close adhesion immediately over the pylorus itself; that is, as if a small fold of the stomach had been picked up and fixed to the outside of the pylorus. This gave a distortion and twist to this part of the organ. When opened the stomach was found dilated and full of black fluid. At the point of the contraction was a large oval ulcer which had nearly encircled the stomach, being two inches long and an inch broad. This had a distinct raised border,

The lower edge appeared at first to be the pylorus, but on further examination the pylorus was seen to be one and a half inches lower down. At the point of contraction the walls were thick and stiff and infiltrated with a white adventitious material. Numerous small glands around were carcinomatous. There were no other secondary deposits and the other viscera were healthy. See *Insp.*, 1856, No. 237.

CASE 37. *Carcinoma of Pylorus. Secondary deposits in lymphatic glands, and in liver.*—Martin F., æt. 65, was admitted under Dr. Gull for vomiting, to which he had been subject for a year before admission. He had all the symptoms of cancer of the stomach, and was very much wasted. He remained in much the same condition until his death, occasionally vomiting his food, but not always so. If he did, it was very soon, and this was against any great impediment in the pylorus; moreover, the stomach never became distended. The abdomen was contracted, and an obscure tumour could sometimes be felt at the scrobiculus cordis. He died about fifteen weeks after admission, and at the autopsy, the stomach was seen in its natural position, but rather contracted, and surrounded by a number of cancerous tumours, which had been originally glands. Along the lesser curvature were three such tumours, each being about the size of a walnut, also smaller ones closely connected with the pyloric end of the stomach. The stomach was found to be rather small; the mucous membrane perfectly healthy in all parts. The little finger was able by some force to pass the pylorus, the contraction of this part being due mostly to the cancerous deposits and inflammatory changes which had taken place outside. The walls at the pyloric end of the stomach were affected by cancer, but were thin, hard and dry, and presented none of the hypertrophy of the coats, which is usually seen when obstruction exists of this part. The mucous membrane was healthy. The cancerous walls at this part were closely united to the cancerous deposits on the peritoneal surface, and the whole diseased structure was decaying, as in inflammatory deposits which are undergoing a cure. Close by, towards the lesser curvature, were some small cancerous masses and the larger masses above mentioned. These were originally glands, and at the present time showed very little true cancerous structure, as they were all fast decaying. Two were reduced to soft, opaque, fatty matter, and the other displayed some of the original cancer, but interspersed with the dead material. There were two small secondary deposits in the liver. The spleen and kidneys and suprarenal capsules were healthy, the heart fatty. The œsophagus presented keratomata. There was recent pleurisy, with chronic phthisis. Sections of the growth were examined in 1891, and showed it to be a carcinoma in which some of the alveoli were lined with ill-defined cylindrical epithelium. See *Insp.*, 1856, No. 226.

CASE 38. *Carcinoma of the lesser curvature of the stomach. Secondary deposits in liver, lungs and lymphatic glands. Ascites.*—William C., æt. 60, was admitted under Dr. Hughes, greatly emaciated, and died about three weeks later. He worked at Woolwich and was of temperate habits. The reporter stated that he gave the following history, which coincided with what the patient told the physician, namely, that for two months his health had been failing and that he had suffered from severe pains in the pit of the stomach and in the loins, but he had never vomited and had never passed

any blood. On admission, he was extremely feeble and very anæmic, making it very certain that he had lost blood. The motions passed were dark, but as he was taking iron a doubt was felt as to their containing blood. The liver could be felt enlarged and nodular, suggesting carcinoma of that organ. He never vomited while in the hospital, but rapidly became more anæmic and more feeble until he died. Shortly before death he vomited some coffee-ground material. At the autopsy, the body was found to be much emaciated and the peritoneal cavity contained three or four pints of clear serous fluid. After removing the liver and bringing the stomach into view, a large cluster of malignant glands was seen at the lesser curvature, one being the size of an egg. When the stomach was taken out, a large tumour was felt to exist within the organ, as large as that without, and on cutting it open along the greater curvature a soft, carcinomatous growth was seen occupying the lesser curvature. This was sloughing and emitted a horrible odour; it was of a darkish, green-brown colour and its tissue quite broken up. It was very vascular and had no doubt been the source of much hæmorrhage. It had probably been about the size of a closed fist. It occupied about half of the length of the lesser curvature and was much nearer to the œsophageal than to the pyloric end. This was, no doubt, the primary cancer in the body. The stomach was large and everywhere else healthy. It contained a light-brownish fluid, the colour, no doubt, due to some hæmorrhage from the growth, but there was very little marked appearance of blood either here or in the intestines. At the seat of the growth the walls of the stomach were beginning to slough, so that the surface of the pancreas was slightly involved, and an opening was made on removing the organ, so that a perforation of the stomach might soon have occurred. The liver weighed seven pounds, twelve ounces, being greatly enlarged by carcinomatous growths throughout it. More than half of the substance was thus occupied. Secondary deposits were discovered in the lungs, the rest of the viscera being healthy. See *Insp.*, 1857, No. 46.

CASE 89. *Stenosis of Pylorus. ? Sarcomatous infiltration. Great dilatation of stomach. Phthisis.*—Mary W., æt. 22, was admitted under Dr. Addison with gastric symptoms. She was a married woman, and stated that three years ago she had had scarlet fever and had not been in perfect health since, the symptoms from which she now suffers appearing to begin soon afterwards. They were pain in the chest and occasional sickness. She, however, was in tolerable health, though the symptoms never entirely left her; she was married about two years ago. A year after the onset of symptoms, she felt the pain in the stomach to be more severe, and vomiting then set in. Eleven months ago she was confined, and two weeks afterwards she perceived a lump in her abdomen. She suckled for several months and was then obliged to give up her child as the gastric symptoms were more severe and her health more affected. The last four months much worse. She has had a constant burning, gnawing pain at the stomach and vomited everything taken. She lately vomited a little blood. On admission, she was seen to be in a wretched state of emaciation and a tumour could be felt in the right hypochondriac region. She constantly vomited. She continued with these symptoms, it appearing remarkable that she could survive from day to day. She died twelve weeks after admission, and at the autopsy, the body was found to be wasted to the utmost degree. The

upper lobes of both lungs were disorganised, being full of small cavities, empty and suppurating, amongst a quantity of soft, inflammatory material, such as is seen in ordinary acute phthisis. On opening the body, the stomach was seen to be enormously extended. It occupied the whole of the abdomen and reached to the pelvis. It was thus the only organ visible. The pylorus was considerably dragged down but not proportionately with the remainder of the organ, so that the stomach was much bent upon itself, the greater curvature forming the larger part of the segment of the circle. The thickened pylorus formed a hard tumour, the size of an egg. When the organ was opened it was found quite healthy, except at the pyloric end. It contained only a small quantity of fluid. The finger could not be passed through the pyloric orifice. The section of the pylorus displayed a well-marked specimen of scirrhus disease. The walls were very much thickened, and consisted of two portions having a very different appearance; one grey and transparent, the other an opaque white. The thickening was gradual, beginning by a point in the stomach and ending the same way at the pylorus, but gradually increasing towards the middle, where its walls were half an inch in thickness. The diseased structure occupied a length of three inches, and the circumference of the opening was nearly an inch. The serous membrane without, and the mucous membrane appeared quite healthy, the thickening depending upon the formation of a dense white substance in the submucous tissue associated with hypertrophy of the muscular coat. These two, the one being white and opaque, the other translucent, constituted the whole thickness. The mucous membrane gradually passed into the former. The muscular tissue occupied about two-thirds of the thickness, and the white tissue the remaining third. Although there was a distinct separation between them, the line of demarcation was not straight, the white tissue here and there protruding into the muscle. They were both very hard when cut with a knife, particularly the white tissue. Where the walls of the organ began to grow thick there had been two or three small protrusions of mucous membrane into the stomach, and one in particular occupying the line of the greater curvature. On cutting through these they were seen to be formed of the same dense white submucous tissue as at the pylorus. A microscopical examination showed the muscular tissue to be of the ordinary character; the dense white tissue was so tough that it could not be torn to pieces by the needles. It was seen to be composed of ordinary fibrous or wavy tissue, and amongst it some translucent albuminous substance. In the similar tissue in the independent nodules just mentioned there was less density and less numerous nuclei could be seen. There was, however, nothing remarkable in their appearance; they did not seem to differ from the nuclei which could be scraped from the mucous membrane. There were no secondary deposits. See *Insp.*, 1857, No. 51.

CASE 40. *Villous carcinoma of pyloric end of stomach. Invasion and adhesion of neighbouring organs. Secondary deposits in liver, pancreas and lymphatic glands. General peritonitis.*—Edward K., æt. 46, was admitted under Dr. Rees with jaundice and emaciation. He stated that he only had been ill for a month, and that he had never vomited. Four days after he was admitted he died, and at the autopsy, general peritonitis was found. There was a large mass of cancer in the lumbar glands pushing the viscera forward.

The colon and stomach were united, and separated with difficulty. The aorta passed through the disease below; the kidneys and supra-renal capsules could also be separated, and were found healthy. The stomach was firmly united posteriorly to the pancreas and diseased glands, as were the duodenum and lower part of the liver. The hepatic vessels were surrounded and pressed upon. There were a good many nodules of cancer in the liver, the whole of the organ was pale and very fatty, the gall-bladder much thickened, the spleen unaffected. The stomach could be dissected off the cancerous glands behind, except near the pylorus, and there the coats of the organ were involved in the disease. Upon opening it a large mass of cancer about two inches long and one and a half inch broad was seen at the pylorus. It was raised from the surface, very vascular, and when placed in water had a shaggy villous appearance. At one spot ulceration had occurred. The pancreas behind was very dense in structure, partly indurated and partly cancerous. The other viscera were normal. *See Insp.*, 1857, No. 89.

CASE 41. *Carcinomatous infiltration of pyloric end of stomach. Secondary deposits in peritoneum and general peritoneal adhesions.*—Elizabeth G., æt. 60, was admitted under Dr. Lever with symptoms thought to be due to malignant disease of the peritoneum. She had suffered for seven weeks with pain in the abdomen, and on admission her abdomen was tender, distended, and a tumour was to be felt. The case was thought to be one of carcinomatous ovarian disease. She died four days after admission, and at the autopsy the body was wasted and the abdomen distended. Irregular hard nodules were to be felt, some of which were dull on percussion whilst others were resonant. On opening the cavity all the viscera were found firmly adherent to each other, and these again to the abdominal wall, the latter by recent adhesions. There was no ovarian disease as expected, but the nodules were formed by the indurated omentum and contracted coils of intestines. The whole serous surface was covered by numerous "tubercles" as is seen in cancer of this membrane intermixed with inflammatory lymph which united all the parts together. The omentum was drawn up into a thick, hard mass, of great density, its structure being composed of a dense fibrous tissue interspersed with fat. The stomach was united by its surface to the surrounding parts and on cutting through the coats of the pyloric end they were seen to be very much thickened and indurated by the deposition of a firm white tissue. This was a quarter of an inch thick and was situated between the serous and mucous coats. It was continuous with the hypertrophied muscle near the pylorus and it thus appeared as if the latter structure had been replaced by the cancerous deposit. There were no enlarged lymphatic glands about it. The rest of the viscera were normal except that the kidneys showed commencing degeneration, weighing six and a half ounces. *See Insp.*, 1857, No. 107.

CASE 42. *Early carcinoma of pyloric end of stomach. Death from puerperal fever.*—Emma P., æt. 34, was admitted under Dr. Lever, and shortly afterwards gave birth to a child. Seven days afterwards she died from puerperal pyæmia, the lungs being gangrenous, the uterus sloughing and the kidneys in a condition of acute nephritis. The stomach is preserved in the museum, and is described as follows:—"A portion of the pyloric end of the stomach having, just within the pylorus, a small area over which the mucous

membrane is raised and has a polypoid appearance. The surface is not ulcerated. Histological examination shows that there is a growth of spheroidal cell carcinoma, which infiltrates the submucous tissue, but does not invade the muscular coat." No malignant growth was found in any other organ. *See Insp.*, 1857, No. 109. *Prep.* 705.

CASE 43. *Large cancerous ulcer of lesser curvature of stomach adherent to and invading liver. Fatal hæmatemesis. Secondary deposits in glands, liver, kidney, pericardium and pleura.*—John K., was admitted under Dr. Addison for enlargement of the liver. He had been ill for some time, and attributed his present condition to an injury received four months previously, when he was struck on the arm and rendered insensible. A week afterwards he experienced pain across the abdomen with a sense of resistance, and at this time vomiting came on. He was admitted on November 11th, and died on December 3rd. At the autopsy, the body was found much wasted, and a large, nodulated liver was perceptible through the abdominal parietes. The stomach contained a large cancerous ulcer, and was much altered in position by its adhesion to the liver. The cancer occupied a space the size of the palm of the hand, surrounded by hard, raised edges. Its surface was sloughing, and from it fatal hæmorrhage had occurred, the stomach being quite filled with a coagulum, as well as the upper part of the intestines. The ulcer occupied the lesser curvature, and was within an inch of the pylorus. Its base had contracted adhesions to the extreme edge of the left lobe of the liver, and the organ was thus very much displaced. Upon cutting through the ulcer, its base was seen to be quite incorporated with the liver. The natural coats had been destroyed, and in their place was a dense fibrous tissue. The right side of the ulcer was free of the liver, and was connected with some large cancerous attached glands behind it, in the fissure of the liver. The liver was almost double its natural weight, and was filled with hard cancerous deposit, more than half its substance being thus occupied. One kidney was much wasted and cystic, the other healthy and showing compensatory hypertrophy. It contained a few cancerous tubercles. The pleura of both lungs was covered with thick patches of cancer, hard, and at first sight like simple inflammatory exudation. In one or two places they invaded the tissue of the lung. The pericardium contained one or two small cancerous tubercles on the surface of the heart, penetrating the substance of the organ. They were small and firm, and had probably been developed in the serous membrane and afterwards invaded the myocardium. They were all in the left ventricle and anteriorly. The heart itself was healthy with the exception of adhesion of two aortic valves. *See Insp.*, 1857, No. 229.

CASE 44. *Sarcoma of the pyloric end of the stomach and duodenum. Secondary deposits in ovaries and lymphatic glands. Empyema.*—Elizabeth S., æt. 18, was admitted under Dr. Addison on January 6th, and died March 24. h, 1858. For four months preceding admission she had suffered from pain in the abdomen and sickness, and her medical attendant had diagnosed a tumour. Vomiting still went on until admission. When taken in she was thin but not very ill and the catamenia had ceased. Hardness could be felt above the umbilicus which seemed to correspond to the rectus muscle. In the few following days the tumour varied in position, being sometimes felt

and at other times scarcely perceptible, so that it was thought by some to be of a kind called phantom. The girl, however, continued very ill with gastric symptoms and the tumour remaining permanently, it was very evident that organic disease existed. Later a second tumour was felt at the lower part of the abdomen. During the two weeks before her death she suffered from pleurisy. At the autopsy, the stomach was found to be indurated by malignant disease so as to form a distinct tumour. The colon was firmly united at its lower part and could only be separated by cutting through the cancerous deposit with a scalpel. The stomach was rather dilated and its pyloric half converted into cancer, the cardiac end remaining free and the line of demarcation between them being tolerably well defined. The disease was of the kind usually seen in cancerous disease of the pylorus, that is infiltration of the new material into the submucous tissues producing a dense white structure. The stomach is preserved in the museum and is thus described: "A portion of a stomach and duodenum showing a flat mass of growth measuring four by six inches which occupies the pyloric end of the stomach and extends a short distance into the duodenum. The mucous membrane covering the growth is smooth and in parts superficially ulcerated. Towards the œsophageal orifice the edge of the plaque is abrupt and overhangs the healthy wall beyond, which is bent back and fixed behind it. In the opposite direction the limit of the growth is ill-defined and the pyloric ring is obliterated. A section through the infiltrated wall shows the submucous and muscular coats of the organ to be replaced by a growth which examined histologically has the character of a round-celled sarcoma." Dr. Wilks, who made the autopsy, further reports that the malignant deposit was chiefly in the submucous tissue and that in parts the walls of the stomach were three-quarters of an inch thick. Some malignant growth was also apparent beneath the serous investment and thus the muscular fibres lay in between the cancer of the submucosa and the cancer beneath the peritoneum. Towards the under surface and the lesser curvature there was a projection externally, and at this part the whole coats were invaded and the pancreas was firmly involved in the disease. The neighbouring lymphatic glands, as well as the lumbar glands, were somewhat enlarged, and the ovaries were each about the size of a cocoa-nut or the two closed fists; they were of an oval shape and had a smooth surface. On cutting them open they were seen to be composed of cancer, a few cysts, and, around the circumference, much diffused fibrinous deposit. Dr. Wilks says: "A further examination of the stomach and the ovaries, showed the structure to be fibrous or fibro-cellular, very like the recurrent fibroid tumour which is found in the extremities." The liver, spleen and kidneys were healthy. The left chest contained several pints of purulent fluid and the left lung was compressed and carnified. See *Insp.*, 1858, No. 61.

CASE 45. *Cylindrical-celled carcinoma of the lesser curvature of the stomach, infiltrating the anterior and posterior walls. Secondary deposits in liver, ovary and lymphatic glands. Tuberculous enlargement of cervical and mesenteric glands.*—Helen W., æt. 33, was admitted under Dr. Rees, on September 23rd, 1857, and died July 9th, 1858. She was a servant in the City, and came to the hospital on account of vomiting, which she had had for nine months. These symptoms continued during the nine months she was in the hospital, with little intermission, and after some time a tumour could

be felt at the upper part of the abdomen. Some glands in the neck, which on admission were found to be enlarged, continued to increase in size. At the autopsy, the body was wasted and the enlarged glands of the neck were found to be infiltrated by tuberculous deposit. The stomach was much reduced in size, and by the infiltration of its walls was more like a solid tumour than a membranous bag. About three-quarters of the whole structure was occupied by cancer. This extended from the margin of the œsophagus to the pylorus, and took the course of the lesser curvature, so that the only part of the organ that remained free was a narrow strip reaching from end to end along the greater curvature. The disease terminated rather abruptly in the healthy portion. The coats were unequally thickened by the disease, but in some places a section was three-quarters of an inch in thickness. The adventitious matter appeared to be situated primarily in the submucous coat. The muscular coat near the pyloric end was much hypertrophied, and formed streaks of transparent tissue in the midst of the cancer. The growth was whitish and exuded a juice on pressure. The lesser curvature was adherent to the pancreas, whose contiguous surface was involved in the cancer. Also the neighbouring glands were infiltrated by deposits. The mesenteric glands, however, were caseous. The liver contained numerous nodules of cancer, many of them soft and vascular, and presented the ordinary appearance of medullary disease except in being rather firmer. Some nodules, however, were dry, white and firm, somewhat like those in the neck. The right ovary was enlarged to the size of an egg by a softish fibrous growth containing a white or yellowish amorphous matter. There was pneumonia in the lower lobe of the left lung. The kidneys and spleen were healthy. The liver weighed two pounds and three ounces. The growth was examined in 1891, and was found to be a cylindrical-celled carcinoma. See *Insp.*, 1858, No. 140.

CASE 46. *Stomach invaded by growth of the peritoneum, secondary to cancer of the ovary.*—Anne H., æt. 45, was admitted under Dr. Habershon on August 4th, and died on October 11th, 1858. She was admitted for swelling of the abdomen, which began about the previous Christmas. On admission, the abdomen was found to contain much fluid, and tapping was performed. She lingered for some weeks, and at the autopsy was found to be suffering from general malignant disease of the peritoneum and recent peritonitis. The stomach and transverse colon were both much puckered and contracted. The stomach was very small, and at one spot the cancer had invaded its coats, but had not reached the mucous membrane. The pleuræ contained two or three pints of clear serum, and there were a few cancerous tubera on the surface. The lungs were free from secondary deposit. The capsule of the liver, with the peritoneum, was much thickened and the whole organ contracted, but the tissues healthy. The kidneys were healthy, and the spleen also. Some coils of the intestine, and the rectum, uterus and ovaries were united together by cancerous deposit, and the ovaries themselves contained large cancerous masses or cysts. Probably the disease was primary in the ovaries. See *Insp.*, 1858, No. 194.

CASE 47. *Carcinomatous stricture of the pylorus. Secondary deposits in liver, obstructing the bile ducts. Jaundice.*—Elizabeth T., æt. 47, was admitted under Dr. Gull, on December 29th, and died on February 3rd, 1859. She was suffering from general and extreme jaundice and wasting; no pain.

The edge of the liver could be felt, and a rounded protuberance from its surface, which appeared to be rather a distended gall-bladder than a tumour. At the autopsy, the gall-bladder was found to be much dilated and its coats thickened. Glisson's capsule and the portal fissure were occupied by a dense mass of white tissue, which was probably cancerous in character. The jaundice was due to obstruction of the ducts. Dr. Wilks says that the disease appears as if it had been in the first place a chronic thickening of ducts. The liver was of a greenish hue, but not extremely so. The mucous membrane of the stomach was much congested, and the pyloric orifice was narrowed so that it would only admit the little finger through it. In the submucous tissue was a little soft deposit of cell structure (cancer). See *Insp.*, 1859, No. 20.

CASE 48. *Carcinoma of the lesser curvature of the stomach. Secondary deposits in liver and lymphatic glands.*—Esther P., æt. 34, was admitted under Dr. Pavy on April 13th and died on April 25th, 1859. She had suffered for four months from loss of appetite, vomiting and other gastric symptoms. On admission, the liver could be felt much enlarged. At the autopsy, the body was spare but not much wasted, and the stomach was found to be much contracted and empty. The lesser curvature was occupied by a large cancerous growth in its walls as large as the palm of the hand, and the surface ulcerated. On the external surface there were numerous large cancerous glands attached to and surrounding the pancreas, which organ, however, was not itself involved. The liver weighed eleven and a half pounds, and was greatly enlarged by cancerous deposits forming tubera of considerable size, occupying the greater part of its structure. These deposits were highly vascular and softening in their centres. The portal vein was quite filled with cancerous thrombus in all its branches. The spleen and suprarenal capsules healthy; the lymphatic glands in the upper part of the abdomen affected. Kidneys, pelvic organs and lungs healthy. See *Insp.*, 1859, No. 78.

CASE 49. *Carcinoma of pylorus. Adhesion of stomach to parietes. Perigastric abscess. Gastro-colic fistula. Secondary deposits in lymphatic glands.*—James E., æt. 61, a hawker, of intemperate habits, was admitted on March 16th and died on June 19th, 1859. In 1852 he first had symptoms of dyspepsia with occasional vomiting, cough and dyspnoea; gradual emaciation. Last July he noticed a small hard tumour in the left hypochondrium which gave him very little pain, but steadily increased in size. At that time he suffered from nausea and occasional vomiting after food, and a short time before admission the pain and irritability of the stomach had considerably increased. On May 1st, his aspect was noted to be that of malignant disease; his abdomen was tense and resisting, and in the left hypochondrium a hard, tender tumour was felt, of the size of the palm of a child's hand, and variously situated at different times according to the distension of the stomach. It was dull on percussion and pulsatile. There was pain between the scapulæ, and dysphagia of solids. Vomiting three or four hours after food. Tongue brown at the centre and white at the sides. Bowels constipated, urine high-coloured, specific gravity 1020, no albumen or sugar. Œdema of legs. On May 24th, he contracted erysipelas of the face with aggravation of the previous symptoms. On

June 8th, the erysipelas had subsided, but the tumour was increasing in size. On the 17th, he was getting weaker, and vomited not only after food but constantly. On the 18th, vomits every five to ten minutes, much exhausted. Breath offensive. 19th, vomited an hour before death. He never vomited any faecal material. At the autopsy, the stomach only was examined. The lymphatic glands at the lesser curvature and over the pancreas were enlarged and cancerous, but the pancreas itself was healthy. The tumour felt during life was seen to be at the pyloric end of the stomach, forming a mass of disease the size of a closed fist. It was firmly adherent to the abdominal parietes and to the edge of the left lobe of the liver. On removing the stomach and tearing it free from the abdominal wall, a small abscess was opened. This was seen to arise from an extension of the cancer to the exterior of the organ, which had set up a local peritoneal inflammation. On cutting open the stomach it was seen to be of the usual size, the fundus and oesophageal end healthy, the pyloric end occupied by a large mass of cancer. This commenced at the pyloric valve and extended inwards to the distance of about three inches, and entirely surrounded the stomach, and thus when the organ was opened a cancerous surface as large as the palm of the hand was revealed. The disease had grown in the mucous membrane or in the submucous coat, and had sprouted inwards in large fungating masses so as to fill up this part of the cavity. The surface was sloughing in parts and of a green colour. When these fungoid growths were cut through they presented the ordinary appearance of encephaloid cancer, soft and vascular. The disease had a distinct raised boundary which separated it from the adjacent healthy mucous membrane. On the posterior wall the muscular coat was untouched but much hypertrophied, but in front this coat, as well as the peritoneal, had become involved, and hence the adhesion to the parietes. Also below this spot an adhesion had formed to the colon, and here a fistulous communication existed between the stomach and the gut. See *Insp.*, 1859, No. 118.

CASE 50. *Colloid carcinoma of pylorus. General involvement of peritoneum and omentum. Recent peritonitis.*—Robert C., æt. 48, was admitted under Dr. Rees, on December 16th, 1859, and died on January 22nd, 1860. No clinical account of the case is preserved. At the autopsy, the body was found much wasted and the abdomen was distended with fluid. The intestines were drawn backwards from contraction of the mesentery, and thus did not nearly reach the parietes. Above them was the omentum converted into a solid substance by cancerous infiltration. This ran across the abdomen like a band fixed to the colon, and was about three inches in depth, and when cut, half an inch in thickness. To the upper part the stomach was attached by the same carcinomatous substance, and in the lesser curvature and around the pancreas a great mass of disease was situated. The whole peritoneum, however, was affected, and was covered with recent lymph. Besides this it was much thickened by deposit in the subperitoneal tissues. The parietes were thus everywhere nodulated and the diaphragm was considerably thickened by the same disease. The mesentery was much thickened, indurated and contracted, and the whole surface of the intestine was covered with carcinomatous tubercles. The stomach was united to the adjacent parts by the adventitious material which covered all of them, and when opened the pyloric end was found to be involved in the cancer. A large growth in the submucous tissue occupied

this end, reaching as high as two inches from the pylorus, and more than half an inch in thickness. The section showed the muscular coat running through it, more diseased on the mucous than on the peritoneal side. The growth formed a distinct edge where it terminated. Its surface was vascular, slightly eroded in parts, though the mucous membrane was not actually destroyed. The disease in the pylorus was closely connected with a similar condition in the lesser curvature. Here a large mass of the adventitious matter existed. In structure this was peculiar, approaching very much to colloid. It was white and firm when cut, and when squeezed did not emit a juice, but a thick gelatinous matter. This was more especially seen about the stomach. The deposit on the omentum was harder, drier and more granular. Some sections of the morbid product appeared to consist of true colloid—that is, contained small nodules of transparent gelatinous matter. The disease had extended around the cesophagus, and at this part the diaphragm and liver were adherent, and the surface of the latter was slightly involved in it. See *Insp.*, 1860, No. 19.

CASE 51. *Sloughing carcinoma of the pyloric end of the stomach. Secondary deposits in lymphatic glands. Tubercle of lung and suprarenal capsule.*—John S., æt. 42, was admitted under Dr. Barlow on December 21st, 1859, and died on February 18th, 1860. He was a sailor, having lived in the Tropics and lived “hard.” He was said to have suffered from dysentery. When admitted he complained chiefly of cough. This symptom was treated with relief and the man left his bed. About the middle of January he was seized with sickness, and this continued better or worse until his death, together with a gnawing pain at the scrobiculus cordis. About a week before death he vomited about half a pint of blood. The man’s face and hands were of a brown colour, which was attributed to his having been in hot climates. At the autopsy, the body was much wasted and nothing could be detected on abdominal examination. The abdominal parietes were, however, found to be united by fairly recent adhesions to the stomach; and the colon also was adherent in the situation of the pylorus. When the stomach was opened a large sloughing cancerous ulcer was found at the pylorus; it was limited below by the edge of the stomach and above it reached a distance of between two and three inches, occupying altogether a space as large as the palm of the hand. The surface was sloughing so that pieces could easily be detached from it, and owing to the stomach having been separated from its adhesions to the liver and colon a large ragged opening existed through its walls. A thin layer of adventitious material could be seen beneath the remains of the mucous membrane. The adjacent lymph glands surrounding the head of the pancreas were much enlarged by cancerous deposit, as were also some of the glands around the aorta. The right suprarenal capsule contained a material which on histological examination proved to be tuberculous, though thought by Dr. Wilks, when he made the post-mortem examination, to be cancerous. It forms the preparation in the Museum No. 1542. The liver, spleen and kidneys were healthy and the large intestine showed no sign of old or recent ulceration. The right pleura was, however, adherent and the right apex of the lung showed much indurated tissue from “chronic pneumonia,” no doubt tuberculous. See *Insp.*, 1860, No. 36.

CASE 52. *Carcinoma of the pylorus. Chronic phthisis.*—Isabella H., æt. 39, was admitted under Dr. Gull on February 8th, 1860, and died on April 4th. For eighteen months she had suffered from pain in the abdomen, and subsequently felt a lump, which pulsated. During the whole of last year, more or less vomiting. A few weeks previously she had been in Martha Ward, when a tumour was felt about the umbilicus, which pulsated, being evidently raised by the aorta. She experienced some relief and was discharged. She was again admitted with sickness, but as soon as she was placed in bed this symptom subsided, and she remained comparatively comfortable, taking little, and gradually becoming emaciated, the tumour remaining the same. At the autopsy, the body was much wasted, and the abdominal walls were firmly adherent to the stomach at the pylorus. The stomach itself was small. On opening the viscus a large ulcer was seen at the pylorus. It was limited by the latter, which formed a raised border of considerable dimensions, composed of mucous membrane and dense tissue beneath. The ulcer proceeded backwards in an irregular form with a portion of mucous membrane between, as if originally there had been two separate ulcers. In one of these the coats of the stomach were quite destroyed, the floor of the ulcer being formed of a dense cellular tissue, which was firmly united to the abdominal walls externally. The other presented merely a wasted condition of the mucous membrane, the muscular coat externally being hypertrophied. The ulcer was limited behind at the pylorus by a raised border of mucous membrane, with much dense cellular tissue beneath. The stomach, which was preserved, was examined histologically in 1891, and the examination showed the tissue to be infiltrated by a growth of scirrhous spheroidal carcinoma. There were phthisical cavities in both lungs. There were no secondary deposits. See *Insp.*, 1860, No. 70.

CASE 53. *Carcinoma of the pylorus. Secondary deposits in lymphatic glands. Hydatid cyst of the pelvis.*—William A., æt. 52, was admitted under Dr. Habershon on March 28th, 1860, and died April 21st. He was suffering from all the symptoms of a cancer of the stomach with extreme emaciation. At the same time he had a large tumour at the lower part of the abdomen, evidently a cyst, containing fluid and corresponding in position to the bladder. It, in fact, exactly corresponded to a distended bladder, but when a catheter was passed it did not enter the cyst but went on one side. At the autopsy, the body was extremely wasted and the left leg swollen. The lower part of the abdomen showed a prominent tumour which proved to be a pelvic hydatid. The stomach was slightly drawn upwards at its pyloric end from adhesions at this part. The colon was also adherent. When the viscera were removed, the stomach was seen to be contracted or girt about by inflammatory tissue and cancerous deposits. There were also some cancerous glands around. The head of the pancreas was firmly united to the posterior part of the stomach. On opening the stomach, the contents were brown but contained no blood. At the pylorus was a large cancerous growth the size of a five-shilling piece; or rather an ulcer surrounded by a hard margin of cancer. The floor of the ulcer was composed at one part simply of tough tissue uniting it to the pancreas, the mucous membrane being quite destroyed. The raised cancerous margins were very vascular on the surface and their substance was composed of white, soft, cancerous matter. Excepting for a few cancerous glands in the neighbourhood of the

disease, there was no cancer elsewhere. The liver, spleen and lungs were healthy; the heart very small. The kidneys were also small and healthy. *See Insp.*, 1860, No. 80.

CASE 54. *Carcinoma of the lesser curvature of the stomach infiltrating the pancreas. Great enlargement of liver by secondary growth. Deposits in lymphatic glands.*—John D., æt. 52, was admitted under Dr. Wilks on July 1st, 1860, and died on July 7th, being a hard-drinking, intemperate man. He was so ill that he could hardly give an account of himself; he said, however, that he had only been ill six weeks altogether. He had previously suffered from vomiting, which he attributed to bilious attacks. The liver was felt to be immensely enlarged. At the autopsy, the body was wasted and of a slightly greenish colour. On opening the abdomen the liver, which weighed eight pounds, was found completely to cover the stomach, colon and some of the small intestines, the colon being closely adherent to the stomach and lying behind its anterior margin. A large mass of cancerous disease lay behind the lesser curvature of the stomach involving both the stomach and the pancreas. There were also large tumours formed by the lymphatic glands. The stomach itself was small and the walls thickened by malignant deposit extending from the pylorus nearly as far as the œsophagus, the parts near the lesser curvature being alone affected. At one spot softening and ulceration had occurred, and nearly penetrated the coats of the organ. The infiltration of the liver was almost uniform and there were no tubera. The lumbar glands were converted into a large cancerous mass. *See Insp.*, 1860, No. 115.

CASE 55. *Carcinoma of the lesser curvature and œsophageal end of stomach. Secondary deposits in lymphatic glands and in lung. Pleuritic effusion.*—John E., æt. 49, was admitted under Dr. Habershon, on September 5th, 1860, and died on September 13th. On March 1st the patient experienced pain in the stomach. The pain continued with occasional intermissions, not modified by food. He had no vomiting throughout his illness. The pain was situated in the right hypochondriac and epigastric regions. In the former situation a nodular growth could be felt. Emaciation and anæmia progressively increased, the symptoms otherwise most marked being pain and flatulence. He was almost in a dying state on admission. At the autopsy, the body was found to be extremely emaciated, and the stomach contained a mass of encephaloid cancer the size of the palm of the hand, involving the whole thickness of the lesser curvature to the peritoneum, which, however, it did not invade save by producing a little puckering. The growth was defined towards the pylorus, which it did not involve, but the œsophagus opened into the midst of the growth, so that the orifice was not readily discovered at first sight. The surface of the growth in the stomach was ragged and ulcerated. Some glands in the transverse meso-colon, immediately beneath the stomach, contained masses of malignant deposit forming the nodular tumour felt during life. The liver was healthy, without secondary deposits, the pleuræ contained a considerable quantity of turbid fluid, and at the lower part of the left lung were some nodules of cancerous matter. The heart, kidneys and spleen were normal. *See Insp.*, 1860, No. 142.

CASE 56. *Carcinoma of pylorus and greater curvature of the stomach.*—Anne L., æt. 41, was admitted under Dr. Gull, on June 13th, 1860, and died on January 9th, 1861. No clinical account is preserved, but it is stated that a large tumour could be felt in the abdomen. At the autopsy, the tumour was found to be formed by the coalescence of the stomach, transverse colon and neighbouring glands, indurated into a cancerous mass. The intestine could be separated as well as the other parts, leaving the original disease confined to the pyloric end of the stomach. The stomach presented a hard mass externally at the pylorus, and on opening the organ there was found a considerable cancerous deposit commencing at the pylorus and proceeding inward along the greater curvature, the diameter being between three and four inches. It did not quite reach the lesser curvature above. The growth had a defined, raised border, and the central parts were softening and breaking down. There were no secondary deposits in the liver, and the spleen, kidney and supra-renal capsules were healthy. The lungs were also healthy. The uterus contained several small fibroid tumours. *See Insp.*, 1861, No. 12.

CASE 57. *Carcinoma of stomach. Spontaneous fracture of femur from secondary growth. Deposits also in liver and lungs.*—Mary H., æt. 66, was admitted under Mr. Hilton on May 11th, 1861, and died on May 23rd. She was brought to the hospital with a fracture through the shaft of the right femur, which was said to have occurred spontaneously without injury. She gradually sank, dying at last rather suddenly without any apparent cause. At the autopsy, the bone was found to have fractured in consequence of cancerous infiltration of its substance. Mixed with inflammatory lymph, on the surface of the periosteum was a distinct cancerous growth, firm, and containing spicules of bone. No cancer was found in the cranium or the membranes of the brain. The stomach was covered by a number of nodules, flattened on the surface, and slightly projecting. Many of these were isolated, but at one part was a mass, soft and vascular. The whole diseased surface occupied a space the size of the palm of the hand, and from histological examination made in 1891 it appeared that the growth was a scirrhus spheroidal carcinoma. The liver was full of nodules and tubera of cancer. These were mostly hard, though of varied consistence. Some were isolated, and others more diffused. The lungs contained small secondary deposits. The heart, kidneys and spleen were healthy. *See Insp.*, 1861, No. 97.

CASE 58. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver, kidneys and lymphatic glands.*—Sarah D., æt. 60, was admitted under Dr. Gull on May 15th, 1861, and died on June 24th. No clinical account is preserved. At the autopsy, the body was much wasted, and a tumour was to be felt in the pyloric region. On opening the abdomen the stomach was seen in its normal position, and not distended. The pylorus was thickened, and near it was a large gland, in which was secondary deposit. The gland with the pancreas was easily dissected away, leaving the external surface of the stomach quite free, and not involved in any disease. On opening the organ, the pyloric end was seen to be slightly raised by a growth about the size of the palm of the hand, soft, vascular, and toward the stomach having a raised border. It was in no part ulcerated. On cutting through this vertically the mucous membrane and submucous tissue appeared infiltrated with cancer.

This, although firm, yielded a milky juice on pressure. The section through the pylorus showed this in a similar manner, and external to it was a much hypertrophied muscular layer. Outside this the peritoneum was free. At the lesser curvature and closely adherent to the pancreas were some glands, enlarged by secondary deposit. On section the deposit was found to be of necrotic character. The liver contained several nodules of cancer, and the spleen and supra-renal capsules were healthy. The kidneys contained cancer in an early stage, not in defined masses, but infiltrating several parts of the organ, so that the renal structure was not yet destroyed. In the upper lobe of one lung was a hard mass of deposit, softening in the centre. "It appears," says Dr. Wilks, "to have been simple chronic pneumonia." The lungs were very dark, and much pigment was found in the bronchial glands. The heart was small, but healthy. *See Insp.*, 1861, No. 117.

CASE 59. *Diffuse carcinoma of stomach. Chronic peritonitis, with ascites. Secondary deposits in lymphatic glands.*—Mary F., æt. 44, was admitted under Dr. Rees on December 8th, 1861, and died on January 17th, 1862. She was a washerwoman and was thought to be of intemperate habits. She had been ailing for some weeks, but her symptoms were very obscure. When she came in she had ascites, but was not very ill. There was no proof of the existence of liver disease, but it was thought most probable that this was present. By remedies some of the fluid became absorbed and she was altogether better, but about twenty-four hours before her death she was seized with peritoneal symptoms. At the autopsy, several pints of serum were found in the abdomen, together with some flakes of lymph arising from recent inflammation. When these were removed, the peritoneum was seen to have undergone a chronic inflammatory induration. The intestines were drawn backward by the thickening of the mesentery and the omentum was drawn up and thickened. The colon was much contracted and its appendices united, by inflammatory products, to its walls. The stomach itself felt very hard, like a thick indiarubber bottle, and when opened its coats were found enormously thickened. It forms Preparation 704 in the Pathological Museum, and is thus described:—"A somewhat contracted stomach laid open to show its walls thickened by hypertrophy of its muscular coat, and by adventitious deposit in the submucous tissue. The deposit is general, but is greatest towards the pylorus where the wall is three-quarters of an inch in thickness. There is no ulceration of the mucous membrane. The omenta are thickened and contain some slightly-enlarged lymphatic glands. Histological examination of the walls of the organ shows an excess of fibroid material in the submucosa, with no clear evidence of growth, but in one of the adjacent lymphatic glands there is a deposit of spheroidal-celled carcinoma." The peritoneal covering of the colon and rectum was thought to be affected in a similar way to the stomach, they were contracted, and a section showed the coats as in the stomach—the submucosa being thickened and the muscle hypertrophied. The broad ligament, like other parts, was much thickened, and the uterus was hard from peritoneal contraction. The liver, spleen, kidneys, lungs, and heart were healthy. *See Insp.*, 1862, No. 21, and *Trans. Path. Soc.*, vol. xiii., p. 83.

CASE 60. *Carcinoma of pyloric end of stomach. Perforation. Acute peritonitis.*—John O., æt. 43, was admitted under Dr. Barlow on August

23rd, 1862, and died on September 3rd, with symptoms of general peritonitis. A tumour was felt over the scrobiculus cordis. At the autopsy, a large mass of disease occupied the upper part of the abdomen, formed by the uniting together of the stomach, colon and liver. A rupture had occurred in the stomach, opening beneath the colon and setting up an acute peritonitis. The primary disease was found in the stomach, corresponding with the pylorus. The disease was seen to have affected the submucous coat, and in the centre the whole coats were involved so that they could no longer be separately distinguished, and at one part the disease was seen growing on the exterior. *See Insp.*, 1862, No. 176.

CASE 61. *Carcinoma of the pyloric end of the stomach.*—Ellen C., æt. 52, was admitted under Dr. Rees on September 4th, 1862, and died September 28th. She came in in an almost moribund state, with a large tumour in the middle of the abdomen, evidently connected with the stomach. At the autopsy, the body was found to be much wasted, and the abdominal walls were adherent at the umbilicus to the tumour beneath. This tumour was formed by the pyloric end of the stomach and the colon over it. The neighbouring parts were merely attached by adhesions and not involved in the disease. The stomach was greatly distended. On opening the organ a large cancerous mass, the size of the hand, was seen sprouting from the surface. This was defined on one side by the pylorus, and on the other had a raised edge. The disease had involved all the coats, but had not penetrated the surrounding organs. There were no secondary deposits. *See Insp.*, 1862, No. 192.

CASE 62. *Carcinomatous ulcer on posterior wall of stomach, exposing the pancreas.*—John S., æt. 62, was admitted under Dr. Habershon, and died two months later. At the autopsy, the body was extremely emaciated, and the stomach was less than half the usual size and closely adherent to the liver, so that it was necessary to remove the two organs together. The stomach is preserved and forms Preparation No. 694 in the Museum, being thus described:—"A stomach with the pancreas and a portion of the liver. On the posterior wall of the stomach there is an ulcerated growth, reaching from the cesophageal opening to within two and a half inches of the pylorus. The edges of the growth project half an inch from the surrounding healthy mucous membrane, and in the base of the ulcer is exposed a portion of the pancreas, to which, as well as to the liver, the stomach is bound by adhesions. Histologically, the growth is a carcinoma, most of the alveoli being filled with spheroidal cells, while a few are lined with cylindrical epithelium." There were no secondary deposits and the lungs presented an appearance of hypostatic pneumonia. *See Insp.*, 1863, No. 19.

CASE 63. *Carcinoma of the pyloric end of the stomach invading the duodenum. Perforation of stomach. Localised peritoneal abscess.*—George G., æt. 56, was admitted under Dr. Habershon on October 29th, 1863, and died on March 11th. The patient was very ill on admission with symptoms of organic disease of the stomach, and a tumour was felt in the region of the pylorus. For some time there was considerable pulsation in this swelling. The vomiting ceased and did not occur at all during the last month; but for this period he lay in an almost moribund condition. At the autopsy, the body

was exceedingly emaciated, and the abdominal walls were found adherent over the greater curvature of the stomach. At this part there was a small circumscribed abscess, caused by a minute perforation of that organ. On removing the mass of disease the tumour felt during life was seen to be caused by the pylorus and parts around, The colon was adherent to it below, but only its outer coat was involved. Above the stomach was firmly adherent to the liver as far as its middle portion, and here the liver had apparently prevented a rupture of the stomach into the peritoneal cavity. On opening the stomach a large fungous carcinoma was seen growing all round it at its pyloric end, the exposed surface being as large as the hand. It appeared to have destroyed the pylorus and the commencement of the duodenum, for the raised and thickened border which at first appeared to be the pylorus, was found to be merely the limit of the growth in that direction. Above and reaching nearly to the middle of the stomach was the upper raised border of the growth. Between the two extremes the surface was very uneven, in parts nodulated and bossy, and in other parts depressed where the malignant deposit had sloughed, and the coats of the organ were almost destroyed. At the upper and inner part of the stomach the coats had entirely disappeared, and some fibrous tissue united the stomach to the liver, and formed the boundary of the growth. Just at the edge of the liver the peritoneal coat had given way, and hence the external suppuration above mentioned. Above this spot the muscular coat was much hypertrophied, and only resumed its normal thickness about the middle of the stomach. The liver was healthy, and there was no secondary deposit in any organ, nor in any of the adjacent lymphatic glands. The kidneys were very small and hard. See *Insp.*, 1863, No. 64.

CASE 64. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver and lymphatic glands. Suppurative mediastinitis. Hypostatic pneumonia.*—David W., æt. 63, was admitted under Dr. Rees, on March 4th, 1863, and died March 25th. He was a baker, and had suffered about five or six months with symptoms of gastric disorder. He had not given up work until a week before admission. He was extremely ill, very prostrate, and anæmic. There was a general fulness about the upper part of the abdomen, but no tumour was recognizable. He gradually became more anæmic, and his face was of a brownish or sallow hue. At the autopsy, the pyloric end of the stomach was found to be affected by cancer. The growth could not be felt through the abdominal walls, but it was detectable through the walls of the stomach. The latter was adherent to the liver, and thus on attempting to remove it a rent was produced. On opening the stomach, a large fungous growth was seen encircling the pyloric end, and of about the size of the palm of the hand. The edges were raised and slightly vascular; the other parts were soft and white, and when cut through showed in many places necrosis. Some of the neighbouring glands were somewhat enlarged, and at the œsophageal end there was suppuration extending up the œsophagus on its outer side as high as the bifurcation of the trachea. The liver contained numerous secondary deposits, but there were no secondary deposits in any other organ. There was recent pleurisy with hypostatic pneumonia at the base of the left lung. See *Insp.*, 1863, No. 77.

CASE 65. *Sarcoma of the stomach. Secondary deposits throughout the peritoneum, in the lymphatic glands, and in the right supra-renal capsule.*—Thomas S., æt. 67, was admitted under Dr. Barlow, with symptoms of malignant disease of the stomach, and died a fortnight later. At the autopsy, the peritoneum was found to be affected by malignant disease, the whole surface being covered with minute tubera. The mesentery was infiltrated and made very thick and hard. The omentum was drawn into a dense mass. The colon was adherent to the stomach and adjacent parts. The surface of the liver had numerous growths upon it. The stomach is preserved, and forms Prep. 718, being thus described:—"A stomach laid open to show the lesser curvature in its whole length to be occupied by a mass of growth. Towards the pylorus the growth infiltrates the submucous tissue, and appears as a thick plaque, whilst elsewhere there are several isolated nodules projecting beneath the mucous membrane. Attached to the lesser omentum and surrounding the pylorus and duodenum are seen the remains of a large mass, which in the recent state involved the pancreas and neighbouring lymphatic glands. Histologically the growth is a round-celled sarcoma." Secondary deposits were found in the peritoneum, as above mentioned, and in the right supra-renal capsule. See *Insp.*, 1863, No. 78.

CASE 66. *Carcinoma of the pyloric half of the stomach. Carcinomatous peritonitis with ascites. Secondary deposits in liver, lungs, pleuræ, and in the lymphatic glands.*—Amy C., æt. 38, was admitted under Dr. Wilks on June 3rd, 1863, and died on June 11th. She had been ailing about a year. Her symptoms were at first gastric, attended by vomiting, etc., and subsequently ascites came on. She was almost moribund when admitted. At the autopsy, the abdomen was distended with fluid and the body was much wasted. The whole peritoneal membrane was covered with small, cancerous tubercles and much thickened, the omentum being drawn into a hard, band-like mass, closely connected to the colon, and the colon contracted to the stomach. The stomach was also adherent to the liver and surrounding parts. The stomach when removed was seen to be of about the natural size, but rather hard. The pyloric half was infiltrated by a carcinomatous deposit which in many places was becoming necrosed. The mucous membrane was involved in the cancerous deposit from just below the pylorus to the middle of the stomach. There was no actual ulcer, but the membrane was disintegrating and had a worm-eaten appearance. The greatest thickening was at the pylorus, and from that point it gradually diminished to the middle of the organ. Outside it was covered with small cancerous tubercles, but there was no definite tumour. The liver contained a number of small secondary deposits about the size of peas, which on section were yellow centrally, and more translucent at their periphery. The ovaries and fallopian tubes were involved in the peritoneal thickening, and the uterus was small and wasted. There were secondary deposits in the lungs, pleura, and the glands at the head of the pancreas. The structures in the portal fissure were thought to be encroached upon by the enlarged glands. See *Insp.*, 1863, No. 147.

CASE 67. *Carcinoma of the œsophageal end of the stomach. Localised peritoneal abscess communicating with lower end of œsophagus. Secondary deposits in liver, kidneys, pleuræ, and gastric and bronchial lymphatic glands.*

Mary J., æt. 53, was admitted under Dr. Pavy on September 9th, 1863, and died on November 4th. She was a waistcoat stitcher and led a somewhat improvident life at Stepney, walking over once a week to her place of employment in the City. At the beginning of the year she found herself so weak that she was unable to take her usual walk and her appetite began to fail. Afterwards vomiting came on. As long as she was able she was an out-patient at the Victoria Park Hospital and then came to Guy's. On admission, she was very feeble, exhausted and anæmic. Very little food could be taken and there was constant vomiting after eating. No tumour could be felt in the abdomen but she had great pain and tenderness in the epigastric region. She gradually sank, and at the autopsy, the body was greatly emaciated. The peritoneum was healthy with the exception of adhesions over the carcinoma in the stomach. No disease was apparent in the abdomen until the stomach was lifted up, when its fundus was seen to be adherent to the spleen and a hard mass of disease could be felt there. The spleen was only attached by tough fibrous tissue, the cancer not having penetrated. On opening the organ a large mass of cancer was seen, about the size of the palm of the hand, occupying the œsophageal end. It commenced in that situation and passed towards the fundus and towards the lesser curvature. It had a raised border of soft medullary cancer. The interior was sloughing. At one spot it had penetrated all the coats so that on removing the spleen a small hole was made through which some gastric contents escaped. About two inches above the œsophageal end of the stomach there was a small ulcerated opening in the œsophagus which led into a cavity formed in cancerous glands at the lesser curvature. The abscess cavity was full of dirty fluid. The walls of the abscess were examined microscopically in 1890, and the secondary deposit was seen to be a cylindrical-celled carcinoma. There were secondary deposits in the liver, kidneys, pleura, gastric glands and bronchial glands. *See Insp.*, 1863, No. 268.

CASE 68. *Carcinoma of the greater curvature of the stomach. Great enlargement of liver by growth. Secondary deposits also in lymphatic glands. Ascites. Pneumonia.*—Jeremiah M., æt. 60, admitted under Dr. Gull, on November 23rd, 1863, and died on December 3rd. He was said to have been ill only for a few days, but he was in too low a state for his story to be relied upon. His liver was greatly enlarged, and he had ascites. At the autopsy, the peritoneal cavity contained a few pints of serum, and at the lesser curvature of the stomach was a large cancerous tumour formed by the glands in that situation, which could be dissected off. At the greater curvature was a mass involving the walls, and to this the omentum was closely adherent. On opening the stomach at this part, a large cancerous ulcer was seen, measuring three inches by an inch and a half, with a raised margin. From the middle of the ulcer grew a large cancerous fungus. The liver weighed more than ten pounds, and occupied a very large part of the abdomen. It was full of very considerable masses of cancer; these were soft and vascular, and one or two in the interior were so softened that on section a creamy fluid came out, leaving a hollow cyst. The spleen was healthy, but in the neighbourhood of the stomach and liver some very large masses of cancer were growing

in the glands of the omentum, etc. There were old adhesions of the pleura, and a little recent pneumonia at the base of the left lung. See *Insp.*, 1863, No. 291.

CASE 69. *Sarcoma of the pyloric end of stomach and duodenum. Secondary deposits in mesenteric glands and in one of the kidneys.*—Frederick W., æt. 15, was admitted under Dr. Gull for an abdominal tumour, with jaundice, and died on March 14th, 1864. At the autopsy the tumour was found to consist of the pyloric end of the stomach and duodenum, infiltrated with growth. These parts are preserved in the Museum as Preparation No. 721, and are thus described: "A portion of a stomach and duodenum, shewing an infiltrating growth occupying the pyloric half of the stomach and extending about an inch into the duodenum. The surface of the affected area is in parts covered by stretched mucous membrane and in parts ulcerated. Towards the cardia the edge of the growth is more defined, and a section through the thickened pylorus shews the infiltration to be greatest in the submucous tissue. Histologically the growth is a round-celled sarcoma." The whole of the lesser omentum was also occupied by morbid tissue, which thickened it, and the colon was connected to the stomach by similar growths developed in the greater omentum. The gall-bladder was small and filled with mucus stained green by bile. The ducts in the liver were considerably dilated. The walls of the ductus communis choledochus were markedly thickened by morbid deposit. The lymphatic glands near the growth were enlarged by malignant deposit and also those in the mesentery, the lumbar glands and those in the groin. One of the kidneys contained a soft vascular deposit of cancer. See *Insp.*, 1864, No. 65.

CASE 70. *Carcinomatous ulcer of pylorus and duodenum. Secondary deposits in pancreas, liver and lymphatic glands.*—Charles L., æt. 45, was admitted under Dr. Habershon, on June 29th, 1864, and died on July 10th. No clinical account of the case is preserved. At the autopsy, the body was found extremely emaciated and the stomach was greatly enlarged, reaching much lower than natural. The omentum was adherent to the pylorus, and puckering of the tissues was observed at this part. On handling the pylorus a hard lump was felt. This was composed of the diseased pylorus, with some enlarged lymphatic glands at the head of the pancreas. The latter had in it a cancerous mass about the size of a walnut. This and the small cancerous lymphatic glands could be dissected away from the intestine, leaving the duodenum and stomach very little affected, though here was no doubt the primary disease. At the pylorus was an ulcer about the size of a shilling, partly in the duodenum and partly in the stomach. It had raised edges composed of cancerous material, but these were soft and of cheesy consistence, showing the cancer to be in a degenerating condition. The whole of the walls were not affected, although the glands and omentum were adherent externally, and there was some puckering of the tissues. The liver contained several nodules of cancer, mostly about the size of a marble, the largest being depressed in the centre and showing on section necrotic cancerous areas. The spleen, lungs, heart and kidneys were all healthy. See *Insp.*, 1864, No. 160.

CASE 71. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver, spleen, pancreas, kidneys and lungs.*—Thomas W., æt. 58, was admitted under Dr. Habershon on June 15th, 1864, and died on August 1st. His illness lasted ten months. At the autopsy, the body was much emaciated, and of a tawny colour. A tumour was to be felt in the liver, another below that, and a third above and to the right of the umbilicus. The pyloric end of the stomach had its walls very much thickened by encephaloid cancer which measured about two inches in thickness. The interior presented a ragged, irregular surface partly formed of dead cancer. Some cancerous masses extended along the lesser curvature. The muscle of the stomach was much atrophied there. The liver presented many chestnut-sized, umbilicated, cancerous masses on its surface. They were soft in the middle and one or two of the numerous masses did not reach the surface. The gall-bladder was distended and the spleen contained a small mass of cancer. The spleen was very small. The glands about the region of the celiac axis and superior mesenteric artery were very much enlarged. The lungs, pancreas, and kidneys contained secondary deposits. See *Insp.*, 1864, No. 188.

CASE 72. *Carcinomatous stenosis of pylorus. Secondary deposits in liver and lymphatic glands. Tubercle of lungs.*—Thomas H., æt. 50, was admitted under Dr. Rees on July 27th, 1864, and died on September 5th. The patient was admitted with sickness and symptoms of malignant disease of the stomach, but no tumour could be detected. The sickness was at one time much relieved by carbolic acid. At the autopsy, the body was found much wasted and there were no adhesions about the stomach, but the pyloric end felt hard. On cutting it through it was found to be scirrhus. The orifice was small, the muscular coat extremely hypertrophied, and in the submucous membrane there was a tough white material. The latter had invaded the mucous membrane so as to destroy it in parts. On looking at the surface it appeared irregular and eaten away in parts, but no definite ulcer. There was no protrusion of the growth at any part. Externally the peritoneum was smooth, but there were some small lymphatic glands somewhat enlarged and containing secondary deposit. There were a few small hard nodules of secondary deposit upon the liver. The lungs were tuberculous, the rest of the viscera normal. See *Insp.*, 1864, No. 210.

CASE 73. *Carcinoma of the stomach, with pigmentation of the skin.*—John C., æt. 55, was admitted under Dr. Wilks on September 7th, 1864, and died on September 11th. The patient came in in a wretched state of emaciation, with constant vomiting. The muscles of the abdomen were rigid, and it was questionable whether any tumour could be felt. He presented all the appearances of a case of cancer of the stomach, but at the same time his face and hands were of a remarkable greenish brown colour, as sometimes seen in morbus Addisonii. And this had led to the suggestion of supra-renal disease. Apart from the discolouration, the symptoms were not those of Addison's disease, and it was thought, therefore, quite probable that such would not be found. At the autopsy, the stomach only was examined, and the note of the pathologist is that it was cancerous, the supra-renal capsules being healthy. See *Insp.*, 1864, No. 214.

CASE 74. *Carcinoma of pylorus*.—Joseph T., æt. 47, was admitted under Dr. Rees on November 23rd, 1864, and died on December 11th. He was extremely wasted, taking very little food; has had bad vomiting for some time. His muscles were rigid and no tumour could be felt. It was clear, however, from his symptoms, that cancer of the stomach existed. At the autopsy, the stomach only was examined. The end of the stomach was converted into a hard mass, in consequence of cancer infiltrating the coats for three or four inches inwards from the pylorus. The coats were converted into a hard mass of disease. The peritoneal coat was perfect, although one or two adhesions had occurred. Within, the mucous membrane was destroyed, leaving a rough, irregular surface of exposed cancer, with some fibre tissue. The edge at the pylorus and at the upper part of the growth was well defined. The pylorus was contracted to the size of an ordinary lead pencil. The cancer was hard, but not altogether fibrous, as it gave out a juice. See *Insp.*, 1864, No. 310.

CASE 75. *Carcinomatous ulceration of stomach. Perforation. Peritonitis*.—A patient who died in 1864, under the care of Mr. Lacey. While suffering from gastric symptoms he was suddenly seized with peritonitis and died. At the autopsy some of the contents of the stomach were found in the peritoneal cavity. A portion of the stomach forms Museum Preparation No. 713, and is thus described: "A portion of a stomach showing an ulcerated growth in the centre of which there is an oval perforation about one-eighth of an inch in diameter. There is some granular lymph on the serous coat. Histologically the growth is a spheroidal-celled carcinoma."

CASE 76. *Carcinoma of lesser curvature and anterior wall of stomach invading the abdominal parietes and pancreas. Secondary deposits in liver and lymphatic glands*.—Harriet D., æt. 55, was admitted with an abdominal tumour on February 25th, 1865, and died on March 11th. At the autopsy, the body was found to be much wasted, and a large mass of cancer was discovered in the abdomen, uniting together several of the organs. The growth was adherent to the abdominal walls, and united together the colon, stomach and omentum into one mass. On dissecting these the principal seat of the disease was seen to be at the lesser curvature of the stomach. There was thus a large tumour in the omentum, to which the colon was attached, but the bowel could be removed, and was then found to be unaffected. The upper part of the mass involved the stomach, and thus on removing the abdominal walls this organ was opened. The lower half of the stomach was involved in the cancer, and its walls were destroyed, especially on the anterior aspect. The duodenum was healthy: the pancreas was involved, only a portion of the posterior surface being left intact. The neighbouring glands also contained secondary deposits. The liver showed two or three masses of cancer, which were very soft and semi-fluid, so that when cut a thick gelatinous matter escaped, leaving merely a cellular structure behind. The lungs, heart and spleen were healthy. The kidneys showed slight interstitial nephritis. See *Insp.*, 1865, No. 67.

CASE 77. *Carcinoma of pylorus and liver*.—Henry L., æt. 50, was admitted under Dr. Barlow on March 23rd, 1865, and died on April 17th. No clinical account is preserved and the autopsy was incomplete. The stomach

was found adherent to the under surface of the liver by a hard mass of cancerous material. On opening the viscus a large cancerous ulcer was seen at the pylorus involving the coats and forming a mass with the disease outside. The liver was crowded with large cancerous nodules filling more than half its substance. See *Insp.*, 1865, No. 95.

CASE 78. *Colloid carcinoma of stomach invading the anterior abdominal wall. Large secondary growth in the liver.*—Eleanor M., æt. 32, was admitted under Dr. Barlow, for vomiting and anæmia. On admission, there was a prominent abdominal tumour, which had been noticed for a long time. She died nine months after admission, and at the autopsy, the body was found extremely emaciated. A large malignant tumour occupied the abdomen, involving the stomach behind and the abdominal walls in front, so that it was impossible to say in what part the disease had begun. A section through the tumour opened the stomach, the muscle of the abdomen having disappeared, and thus the new or adventitious walls of the stomach reached the surface. This anterior cancerous wall was two to three inches thick. The external part on section looked like firm cancer, the part corresponding to the original wall of the stomach like colloid; at least, it had a gelatinous, soft appearance. The disease occupied a large part of the front of the stomach. The interior of the latter showed a ragged surface, which was the exposed part of the cancer, for the coats had altogether disappeared. The preparation is thus described in the Museum (No. 696):—"A portion of a stomach and of the neighbouring structures, to which it is firmly united. The mucous membrane has been for the most part removed by ulceration, and thus is exposed a ragged surface consisting of growth which has invaded the surrounding parts. In front the whole thickness of the stomach wall is destroyed, and its cavity is bounded by the muscular tissue of the abdominal parietes. Behind and below there are huge masses of soft gelatinous material. Histologically the growth is a spheroidal-celled carcinoma with scanty stroma." A large mass of secondary deposit was found in the right lobe of the liver about the size of a new-born child's head. See *Insp.*, 1865, No. 109, and *Prep.* 696.

CASE 79. *Carcinomatous ulcers of the pyloric end of the stomach. Perforation with localised peritoneal abscess. Pleurisy. Secondary deposits in lymphatic glands.*—George N., æt. 45, was admitted under Dr. Gull with an abdominal tumour which had been noticed for twelve months. He was also observed to have dulness at the base of the right side of the chest, and he had occasional rigors. At the autopsy, the body was considerably emaciated and there was some recent peritonitis. The interior of the stomach at the pyloric end showed many ulcers whose floors were cancerous. At the upper part of the pylorus towards the liver the mucous membrane was entirely destroyed over two square inches. There was a perforation on the cardiac side of the cancer leading into an abscess cavity within the peritoneum, bounded behind by the pylorus and the liver, to the left by the falciform ligament, and in front by the diaphragm and the abdominal parietes. When the abscess was opened it was found to be full of pus of yellow colour, and when this was removed the lower and hinder part was full of nodular growths of cancer of the encephaloid kind. The growth had spread along the pyogenic membrane within the abscess, starting from the pylorus where the cancer

had evidently taken its rise and where the abscess rested directly on the stomach. There was a considerable layer of thick lymph at the base of the right lung. The lungs themselves were healthy. There was cedema of the pericardium with a few secondary deposits in some of the lymphatic glands about the pylorus. The remaining viscera were normal. *See Insp.*, 1865, No. 172.

CASE 80. *Carcinoma of the lesser curvature of the stomach. Secondary deposits in liver, lung and lymphatic glands. Jaundice. Dilated bile ducts. Recent pleurisy.*—Joseph B., æt. 45, was admitted under Dr. Habershon, on August 23rd, 1865, and died on September 14th. A mass was obscurely felt in the abdomen; there was but little sickness. A week before the patient's death jaundice suddenly came on. At the autopsy, the stomach was found to contain a large smooth growth projecting freely into its cavity, and attached along the lesser curvature for some inches. It approached within less than an inch of the pylorus, but this orifice was perfectly healthy, though perhaps a little small. The growth was soft, vascular and spongy, made up of the most distinct cancer cells, not degenerating to any extent and containing also a large number of elongated cells with nuclei, resembling the cells of columnar epithelium but apparently too abundant to be merely the epithelium of the surface of the growth. The duodenum presented a few spots of ecchymosis. The liver showed several cancerous nodules of no great size, having their centres tinged with bile. The organ itself had its tissues jaundiced, the ducts being much dilated, surpassing in size the branches of the portal vein which accompanied them, and considering the lateness and suddenness of the jaundice this was certainly remarkable. The gall-bladder was somewhat dilated and full of a greenish, viscid, transparent bile. The ductus communis choledochus led through a mass of cancerous glands which surrounded the head of the pancreas. A probe was passed along the duct without much difficulty. The mesenteric and lumbar glands were full of cancerous deposit, which consisted of well-marked cancer cells, many of which, however, were degenerating. The right pleura showed signs of inflammation at its base. There were some old adhesions, and both lungs contained numerous small secondary deposits and were fibroid. *See Insp.*, 1865, No. 230.

CASE 81. *Carcinoma of the pylorus extending into the liver. Secondary deposits in supra-renal capsules and in lymphatic glands. Recent vegetation on aortic valve.*—John T., æt. 56, was admitted under Dr. Rees. No clinical account is preserved. At the autopsy, the stomach was found to be of normal size and its walls very thin. The mucous membrane was minutely injected but not excessively so. At the pylorus, embracing the anterior, upper and lower aspect and leaving only a posterior fifth of its circumference free, was a large encephaloid mass which invaded the substance of the liver. The cancer on section through the stomach coats was seen to invade them throughout, but was a little in advance on its mucous coat, yet but little. It grew freely towards the cavity, was white and easily broke down into a milky fluid. It was vascular on the surface and well deserved the name of encephaloid as to its appearance. The whole of the pyloric valve was invaded, but behind its outline was not lost,

though it was swollen. The cancer evidently spread to the liver by continuity. Several glands behind the foramen of Winslow were much enlarged, but the ductus communis choledochus could be probed and was quite free. Its coats were also free though very near to mischief. In parts, the cancer was soft, yellow and puriform. Both supra-renal capsules were much enlarged by malignant deposit. The right lobe of the liver was nutmegged and the left pale, the contrast between the two lobes being very striking. The kidneys were free from disease. The aorta was very atheromatous, and at one of the cusps of the aortic valve was a soft, red vegetation, about the size of a small pea. See *Insp.*, 1865, No. 283.

CASE 82. *Carcinomatous infiltration and contraction of the stomach. Secondary deposits throughout the peritoneum and in the gastric lymphatic glands. Pleuritic effusion.*—Joshua B., æt. 71, was admitted under Dr. Habershon, on November 20th, 1865, and died on February 15th 1866. He was a lighterman, and had previously enjoyed good health except that he had been in a lunatic asylum at Colney Hatch for eight years and had been out of it for three years. For the last three months before admission he had suffered from pain in the stomach, usually constant, but especially violent after taking food. There is no sickness after taking food. The nurse says he eats pretty well. He says he has eaten hardly anything. He is rather emaciated, and the wasting has come on since the pain. December 6th, he is a good deal better, but complains that when taking food it seems to scald him. He relishes his food. His abdomen is enlarged, and the pain is now intermittent. He is said to have taken no meat except a little on Christmas Day, but according to the sister's report he took food fairly freely. At the autopsy, the peritoneum everywhere, but more especially at its lower part, was studded with white firm scirrhous nodules with zones of dilated veins round them. The size of these nodules rarely exceeded that of a split pea, and with much less elevation. The stomach itself was much contracted and its walls were much thickened, except that for one inch at either end near the cardia and pylorus respectively the coats appeared to be quite normal looking. The thickening ceased abruptly either way. The stomach is preserved, and forms Prep. 701, and is thus described:—"A stomach contracted so as to measure only eight and a half inches along its greater curvature and two and a half inches transversely at its widest part. The wall is thickened throughout, partly by a deposit of growth in the submucous tissue, and partly by muscular hypertrophy. The mucous membrane is slightly ulcerated, and there are secondary deposits in the glands of the lesser curvature. Histologically the growth is a spheroidal-celled carcinoma." The liver was very small, weighing only two pounds, but it was normal both to the naked eye and to microscopical examination. The spleen was very small indeed, and attached to both stomach and diaphragm by cancerous bridles. The lumbar glands were little if at all enlarged, though some seemed rather harder than normal. The aorta was atheromatous, the kidneys were healthy. The left pleural cavity was occupied for about two-fifths of its capacity by a serous effusion. See *Insp.*, 1866, No. 56.

CASE 83. *Carcinomatous ulcer of the pylorus. Gall-stones.*—William C., æt. 70, was admitted under Dr. Wilks. No tumour could be felt. He vomited his food quickly, not more than half an hour after taking it. There

is no statement as to the length of time he was in the hospital. He died on July 26th, 1866. At the autopsy, the contracted pylorus was lower and further to the left than usual, lying nearly on the middle of the spine. The upper three-quarters of the circumference of the pyloric valve, but extending further along the stomach than towards the duodenum, had from the mucous surface the appearance of an ulcer. The floor and edges of the ulcer were inordinately thick, yet proportionately so, that is, the edges were as much thicker than the floor, and as much raised above it as was proportionate to the thickness of the floor. The edges abruptly rose from the healthy part. The substance yielded soft cancer juice very freely. In the ulcer floor the muscular tissue was swollen to half an inch. The stomach coats were very thin, especially the submucous and mucous coats. The muscular was as thick as natural on the greater curvature. The rest of the alimentary canal was normal. The gall-bladder contained several dozens of black stones. The lumbar glands were not enlarged, the spleen small (two ounces). The kidneys, seven ounces, contained numerous cysts, but otherwise healthy. The prostate was enlarged, and the right lung was cedematous. The heart weighed eight ounces, and the aorta was very atheromatous. See *Insp.*, 1866, No. 219.

CASE 84. *Carcinoma of the pylorus and lesser curvature of the stomach. Secondary deposits in the omenta and liver. Obstruction of common bile duct.*—Lewis H., æt. 46, was admitted under Dr. Habershon, and died on September 7th, 1866. During life an abdominal tumour had been felt, which was tympanitic. Jaundice came on during the last fortnight. At the autopsy, the tumour was found to be caused by a cancerous affection of the stomach extending along the lesser curvature especially, but at the pylorus completely surrounding the viscus. Hence the aperture at the pylorus was constricted and tortuous, just allowing the finger to pass through it. The duodenum was healthy. The cancerous growth in the stomach did not present any great thickness. It was ulcerated and covered at points with red granulations. Besides this growth there were a great many round masses of deposit along the gastric edge of the great omentum. The lesser omentum was also the seat of a mass of cancer of considerable thickness. This surrounded the bile-duct. A probe could be passed along the duct into the duodenum, but on laying the canal open it was found completely embedded in cancer for at least an inch. Above this the duct was dilated. Within the liver the ducts were larger than natural, but not dilated to an extreme extent. The only secondary nodule in the liver was in the edge of the left lobe. It extended through the thickness of the edge, and probably had been in contact with the surface of the diseased mass in the stomach. The rest of the viscera were normal, except that the lungs were cedematous. See *Insp.*, 1866, No. 248.

CASE 85. *Carcinomatous ulcer of the lesser curvature and body of the stomach, exposing the pancreas and liver. Erosion of splenic artery. Secondary deposits in liver and pleura. Infarction of spleen.*—Philip S., æt. 45, was admitted under Dr. Wilks, on November 21st, 1866, and died on April 8th, 1867. He was a schoolmaster who had worked hard in his profession. On admission, he was wasted and had no appetite. He had pain, not increased by food. He said that the reason of his not taking food was not the pain after

it but the want of relish for it. No vomiting. Progressive wasting and some pain about the left margin of the epigastrium made up the symptoms of his case. At the autopsy, the body was found to be spare and somewhat emaciated, and the stomach contained a large ulcer, whose floor was formed partly by the pancreas and partly by the liver and for a little by the subperitoneal cellular tissue about the pancreas. The shape and size of the ulcer was about that of the outline of a kidney, the hilum of the kidney being towards the œsophagus. The rest of the stomach wall was very thin, for as the ulcer was at the lesser curvature there was free room for food to pass round it from the greater curvature to the pylorus, which was wide. The parts of the floor of the ulcer were so changed that it was not possible to say how much of the stomach wall was represented in the mass that formed it. The pancreas was almost gone in the middle of the ulcer floor, being there only half an inch thick. Its surface was sloughy. The splenic artery opened by a large orifice at about three-quarters of an inch from the celiac axis into the stomach. The stomach was filled with a hard clot, black and firm on section, brown, possibly from digestion, on the surface; and blood of black colour was throughout the alimentary canal as far as the rectum. The section of the pancreas was slightly scirrhus in appearance, the lobules having disappeared. This remark does not refer to the head and tail of the organ, which were perfect. The outer part of the ulcer excavated the under surface of the left lobe of the liver. Here the surface had the same sloughy appearance as the pancreas, and for a quarter to half an inch was grey and gelatinous-looking and gristly hard. Here, however, the cancer, if any, did not show the same obvious appearances as in the secondary masses. Of these there were two, lobulated on the surface, radiated in appearance. On section one was in the hinder edge of the organ, and the other in the anterior edge. The spleen contained a very large infarct, and the middle branch of the splenic artery was blocked by an embolus. This probably was formed at the point of the artery invaded by the disease, and detached from that place by the stream. The right lung was œdematous, and there was a small plaque of cancerous deposit on the pleura. The sacculus laryngis of the left vocal cord was everted. The stomach forms Preparation 712, which is thus described:—"A portion of a stomach showing an ulcerated growth occupying its lesser curvature, and part of the anterior and posterior walls. In the sloughy base of the ulcer is seen the splenic artery, which has been opened by ulceration. Histologically, the growth is a spheroidal-celled carcinoma with scanty stroma." See *Insp.*, 1867, No. 81, and *Preparation of the Larynx*, No. 2.

CASE 86. *Carcinoma of the pyloric end of the stomach invading the gall-bladder. Carcinomatous thrombosis of gastric veins extending along portal vein to liver.*—James S., æt. 49, was admitted under Dr. Wilks on March 20th, 1867, and died on May 2nd. The patient had been a prize-fighter and on one occasion had had to be nursed long at home after severe punishment received in an encounter. There was a history of a serious fall from a curb. His symptoms were vomiting of altered blood, great pain and nausea with gradual emaciation and lemon-pallid tint of extremities. He lingered long. At the autopsy, he was a slightly-built man with brown hair and considerably wasted. At the pyloric end of the stomach was an open cancerous sore of

the size of the palm of the hand, more extensive on the lesser curvature than surrounding the pyloric orifice. Its edge was very much raised and its floor thick and composed of soft encephaloid cancer. Sloughs of dark brown cancerous matter were in the pyloric ring. There were some small superficial round plaques of cancer on the mucous membrane and these had dots around on the serous surface of the organ. They were evidently cancer-filled veins. Some had soft, thrombus-like contents, others white cancer. The liver had numerous nodules of cancer mostly of the size of marbles throughout it. They were soft in substance. Many branches of the portal vein had soft cancer loosely connected within their channels. This was the case in many instances but chiefly in the left lobe. The masses compressed the tissue in their growth and there were some parts distinctly nutmegged in appearance, strongly contrasting with the general appearance of the tissue, which was pale and uniform. In the nutmegged parts there was fat around the intra-lobular vein. The portal veins which contained the cancer were the size of goose-quills. The stomach is preserved and forms Preparation 711 in the Museum, thus described:—"A portion of a stomach and liver seen from behind and mounted to show the gastric veins along the lesser curvature distended by cancerous thrombus which has spread into the portal veins. There are numerous soft secondary deposits in the liver. On the reverse of the specimen is seen a primary growth encircling the pyloric extremity of the stomach and directly invading the gall-bladder. Histologically it is a spheroidal-celled carcinoma with much stroma." See *Insp.*, 1867, No. 106.

CASE 87. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver and in lymphatic glands. Broncho-pneumonia. Pleurisy.*—Mary W., æt. 64, was admitted under Dr. Rees on May 29th, 1867, and died on June 30th. She was a washerwoman, who had wasted much previous to admission. Her symptoms were very urgent, and for two weeks before her death a pleuritic rub was heard on the right side behind. At the autopsy she was greatly emaciated, and at the pyloric end of the stomach was a cancerous thickening composed of hard, white, encephaloid matter, spreading in the submucous tissue rather than in the muscular coat or in the mucous membrane. The pylorus allowed one finger easily to pass. The edges of the growth were abrupt and its surface ulcerated, but smooth, and not much discoloured. The glands in the portal fissure were as large as chestnuts or filberts. They were black like bronchial glands, but contained secondary deposits consisting of large spheroidal cells. The black pigment was mostly at the periphery of the glands. The liver contained very many hard cancerous masses, varying in size from a chestnut to a pin's head. In parts the deposits infiltrated the parenchyma very distinctly. The gall-bladder was free from gall-stones, and the bile passed into the duodenum on pressure. The upper lumbar glands were cancerous, the spleen was small, the heart normal, and both lungs were in a condition of hypostatic pneumonia, with a considerable amount of accompanying pleurisy. See *Insp.*, 1867, No. 159.

CASE 88. *Carcinoma of cardiac end of stomach, eroding the splenic artery, and involving the solar plexus. Secondary deposits in glands.*—Joseph B., æt. 54, was admitted under Dr. Wilks on April 10th, 1867, and died on July

14th. The patient had been an artilleryman and then a stableman, and had drunk pretty hard. Whilst he was in the hospital cancer cells were found in the vomit. He was sick at first but not for a long time afterwards. He complained that if he swallowed many mouthfuls in quick succession some of them would return. At the autopsy, the body was of a light, yellow colour and very spare. The stomach was moulded on a great blood clot, whose surface was slightly digested. The blood extended down the bowel as far as the splenic flexure of the colon. Around the cardiac orifice was a very ragged cancerous surface. The cancer soft, encephaloid, white on section. It separated the muscular from the mucous coat, raising the latter up, thinning it out, and at last involving it, while the former lost itself in the base adherent to the external parts. Around the cancer were some small separate spots. These were in the mucous membrane easily movable on the parts beneath. These patches were very small and round. The external surface at the affected part was adherent to the surrounding parts, as the pancreas and solar plexus; large branches of the latter ran into the cancer; and the splenic artery opened freely, an inch from its origin, on the ragged surface. A good deal of the coat of the artery was destroyed. The distal part of the artery opened, ran apparently for some distance in the ragged, sloughy surface, so that latterly there can have been little left of the arterial coats to prevent the ultimate catastrophe. To the right of the primary disease, and below and behind it, were very large glands, some of the size of hen's eggs. On section these were harder than the primary cancer, and showed mottling, with yellow, cheesy, dead cancer. The gastric artery was traced on to the stomach wall, and there became included in the cancer, but did not appear to have been ruptured. The cervical glands on the left side of the neck were cancerous, and as large as chestnuts, and the retro-peritoneal glands were also somewhat implicated. The spleen weighed ten and a half ounces, and was very soft and friable. The splenic artery was of the usual size, and there was no embolism in it. The sympathetic nerve was much implicated in the cancer. The liver weighed fifty-nine ounces, and was free from deposit. See *Insp.*, 1867, No. 170.

CASE 89. *Carcinoma of the pylorus. Secondary deposits in pleura, liver and lymphatic glands.*—Charles H., æt. 62, was admitted under Dr. Wilks on April 24th, 1867, and died on September 24th. His prominent symptom was a tumour in the abdomen, with emaciation and vomiting. At the autopsy, the body was extremely wasted. There was a great mass of soft cancer at pyloric end of the stomach. The muscular coat passed over the exterior of the growth but was itself scarcely implicated. The mucous and submucous coats near the pylorus were raised and changed to a soft encephaloid cancer. The affection was not uniform round the pylorus. Part of it was still elevated and though thickened was not altered on the surface. The margin of the growth was raised, overhanging to a small extent the healthy membrane adjoining. The section of this and all the growth gave off freely a very large quantity of milky or creamy juice, like pus in consistency, but clear white in colour. The glands behind the stomach were unequally affected, some being as large as a Tangerine orange and others as large as a chestnut. Some of them were adherent to the pancreas, but that organ was not itself affected. The ductus communis choledochus was dilated so as nearly to admit one's little finger. The liver contained many cancerous nodules; some were small,

others as large as hazel-nuts or even chestnuts. Some of them compressed the tissue around. Some on section showed yellow, dead cancer. The femoral veins contained ante-mortem clots decolourised and semi-adherent. There was some pleurisy, and in the right pleura was a single plaque of secondary deposit. There was also one small gland enlarged over the pericardium. See *Insp.*, 1867, No. 238.

CASE 90. *Carcinomatous ulcer of pylorus. Hypertrophy of muscular coat of stomach.*—Isabella S., *set.* 40, was admitted under Dr. Habershon on June 10th, 1868, and died on July 20th. Her symptoms were said to have dated from but a short time before her admission. When first seen a tumour was felt at the level of the umbilicus, the stomach and its movements being remarkably visible through the abdominal parietes. Constipation was excessive, so that in seventeen weeks she had but one motion. She became jaundiced; was latterly fed by injections. At the autopsy, the body was considerably wasted and the heart was exceedingly small, weighing only three and a quarter ounces. The stomach was drawn down at its pyloric end, so as to lie obliquely from the left hypochondrium to the right lumbar region. At its middle the walls of the stomach were remarkably thick, and on cutting open the cavity the muscle fibre stood out in sharp uneven elevations on the cut edge, a degree of hypertrophy in curious contrast to the state of the heart. At the pyloric end was a lump as felt from without of about the size of a chestnut. This had on the outer and upper face a white, opaque, contracted appearance. Examined on the mucous surface there was seen a hollowed ulcer on a hard base. This on section was found to be composed principally of the swollen muscular coat. The muscular coat came into the base of the ulcer and quickly swelled to three times its normal size, being one-eighth inch thick. Then under the depth of the ulcer it became pink and fleshy and lost its previously very distinct fasciculated striation. On scraping this part of the structure there was seen a milky juice in very free quantity, and this juice on microscopical examination was found to contain cancer cells with nuclei about a third of the size of the cell. It was thus a hard cancer, chiefly implicating the muscular coat. Outside this there was a little fat, almost the only fat in the body. There were no secondary deposits. The liver weighed twenty-eight ounces and was very small. See *Insp.*, 1868, No. 163.

CASE 91. *Carcinoma of the pyloric end of the stomach. Caseous abdominal and axillary lymphatic glands.*—Samuel H., *set.* 52, was admitted under Dr. Wilks on April 20th, 1868, and died on August 12th. About six months before admission the patient began to suffer from vomiting after taking his food. He at first vomited only after a meal, but he gradually had to be more cautious, vomiting always, even after a little food. The vomiting was generally about three or four hours after the meal. No definite tumour could be felt. At the autopsy the costal cartilages were found to be ossified, hard, and firm, so as to make the lower part of the chest stand rigidly round, "and hence no doubt," says Dr. Moxon, "was it that the tumour was not felt." The stomach was hidden beneath the distended colon, the rest of the alimentary canal being much less distended. The stomach was rather small, the walls thick to the feel and opaque-looking over its pyloric third, but not generally. The pylorus was much diseased and in a curious way, the mucous membrane being elevated by cancer in the submucous tissue, but in an irregular manner. Some of the

elevations reached the height of a third of an inch and here the cancer was soft and white, on section yielding much milky juice when scraped. One of the knolls was ulcerated at its summit. Generally there was very little ulceration considering that the cancer was as large as the whole of one's hand. This was remarkable. The pylorus and the part of the stomach near it was very thick indeed. Here the thickness of the muscular fibre on section was a third of an inch by measurement, the submucous coat being only half that thickness. Then as one traced it towards the greater end of the stomach the muscular coat grew thinner and the mucous thicker and elevated as described. It ended in an undefined edge. There was a plum-sized mass just below the pyloric end of the stomach adherent to it and to the colon. This mass appeared to consist of an enlarged gland full of a curdy, cheesy stuff with a fibroid periphery. In the axilla a similar mass of glands was discovered, some of which were ulcerating. The post-mortem report leaves it somewhat doubtful whether these glands were tuberculous or carcinomatous; more probably the former. There were no secondary deposits. The heart weighed nine and a quarter ounces, "a great weight for cancer of the stomach." See *Insp.*, 1868, No. 179.

CASE 92. *Carcinoma of pylorus and lesser curvature of stomach. Enormous secondary growth in the liver. Deposits in gastric lymphatic glands.*—Martha McB., æt. 50, was admitted under Dr. Rees on July 22nd, 1868, and died on August 15th. At the autopsy the stomach was closely contracted, and on its lesser curvature was a growth extending from the pyloric ring to a point two-thirds of an inch from the œsophagus. The cancer was soft and evenly impregnated the whole textures, and reaching the peritoneum presented itself in the form of small grains beneath the serous coat. The mucous face was scarcely at all eroded and nowhere was it dense, nor did it anywhere give signs of age, the cancer being all fresh young material. Hence it appeared as if this was a secondary rather than a primary growth. The alimentary canal, however, contained no other growths. There was an enormous mass of cancer on the right lobe of the liver so that this part of the organ weighed at least six pounds. There was cancerous deposit in several glands at the lesser curvature of the stomach and in the portal fissure of the liver. There were no other secondary deposits. The heart weighed six ounces. See *Insp.*, 1868, No. 181.

CASE 93. *Carcinomatous induration of pylorus. Secondary deposits in liver, lungs and lymphatic glands. Cystic disease of liver and kidneys. Jaundice.*—George P., æt. 57, was admitted under Dr. Wilks on September 5th, 1868, and died on September 27th. He was by trade a bricklayer and had been a hard drinker. He said that he began to feel ill about fourteen days before admission. About a week before admission he became jaundiced. He was unable to sleep and had constant pain in the epigastrium, where a nodule was felt. The right lobe of the liver could be detected two inches below the ribs, and also the distended gall-bladder could be easily made out. His urine was loaded with bile pigment and his motions contained bile. His bowels were regular, his skin hot and dry, his pulse about 110. He was always in good spirits and died rather suddenly. At the autopsy the body was wasted and of the colour of saffron. The pylorus was found to be indurated and cancerous. The liver was much enlarged, weighing 150 ounces, and

was very irregular in shape by reason of innumerable cancerous deposits and cysts. Some of the cysts were of large size and contained clear fluid. The ducts were enormously distended, some to the size of the little finger, and they were full of dark inspissated bile which issued from them wherever the liver was cut across. The gall-bladder was also greatly distended and the duct was surrounded with cancerous tissue, but was quite patent to its opening into the duodenum. A hard nodule felt during life in the epigastrium, in the seat of the pain that the patient complained of, was a mass of cancerous glands below the surface of the liver. The cancer was encephaloid in character. The mediastinal glands contained cancerous deposit. The pancreas was very hard and its duct was involved in the cancerous mass surrounding the gall duct. The lungs were studded with small soft cancerous masses and they were slightly cedematous. The kidneys weighed $26\frac{1}{2}$ ounces, and they were both of them cystic to an extreme degree, the true structure of the kidneys having almost disappeared. The bladder was full of urine containing tyrosin crystals. The heart is stated to have been rather large but its precise weight was not taken. *See Insp.*, 1868, No. 225.

CASE 94. *Carcinoma of the middle third of the stomach. Secondary deposits in gastric and lumbar lymphatic glands.*—John W., æt. 57, was admitted under Dr. Habershon on August 27th, 1868, and died on November 28th. The patient is a wax-doll maker, and has never been a strong man; but has enjoyed good health. For some time he has felt faintness and a sense of hunger after finishing a meal. Three months ago he felt a violent pain in the chest and vomited a quantity of black blood. After that he had mælena. He subsequently was well for two weeks, and then experienced pain on the left side. Six weeks before admission he was obliged to give up work through constant pain, worse after food. He vomits his food about half an hour after taking it. On admission there could not be certainly felt any tumour, but there was a fulness in the epigastrium. The patient improved a little; but left off eating meat. On October 1st a small tumour the size of an egg was felt one inch below and half an inch to the left of the xiphoid cartilage. In November the patient brought up more blood. On the 10th of that month there is a note that he cannot keep down even fluids. On the 12th, “he was vomiting every few minutes last night.” On the 23rd he was fed with rectal injections. At the autopsy, the omentum was found to be turned up over the stomach and adherent to the middle of its anterior aspect at the seat of the cancer. The stomach itself was contracted at its pyloric half, but its cardiac half was dilated and full of a greenish-yellowish liquid. There was a large patch of cancer, as big as the palm of one’s hand, situated on the lesser curvature, midway between the œsophageal and pyloric orifices, and about an inch distant from either of these. This cancerous growth entirely surrounded the stomach, and along the lesser curvature, in the situation corresponding to the growth, were some enlarged cancerous glands. The lumbar glands also contained some malignant deposit, these being the only ones found. On the mucous surface the cancer grew up in lobes that projected into the cavity side by side, rising generally about an inch, and attached by a base about as broad as the width of the growth. The sides of these masses touched each other, and were pale and cream-white, while the projecting face was discoloured from contact with the gastric contents. It had in parts a greenish-yellow colour, finely rough, and looking like scratched leather. Around this main

growth, which quite surrounded the stomach in its pyloric third, there was on either side an edge of spreading growth chiefly towards the cardiac end. This margin had a wavy edge, and was itself white and unbroken generally, but abraded a little at some points, and here the same yellow colour was seen as noted above. There were also some centres of growth at two inches distance from the main growth, one of them forming a hemispherical tumour about half an inch in diameter. A creamy juice could be obtained from the growth. The chief part of the deposit was situated in the submucous tissue, the muscular layer being about three-quarters of the way from the mucous surface. It was hypertrophied to five or six times its natural quantity, and outside it was a thickened subserous tissue of about the same thickness as the muscle. The liver was natural, and there was about an ounce of dark bile in the gall-bladder. *See Insp.* 1868, No. 285.

CASE 95. *General carcinomatous infiltration of the stomach. Deposits in colon, peritoneum, pleura and pericardium.*—Sophia H., æt. 37, was admitted under Dr. Oldham on February 19th, 1869, and died on March 10th. The patient was a laundress who had freely drunk of rum. She had not been well for five or six months. She thought that her stomach began to swell about two years ago. At first the swelling seemed general and it has increased since. On admission the abdomen was large, tense, semi-elastic and fluctuating. It was dull on percussion both in the front and in the back. On March the 7th the swelling was decreasing and the abdomen measured thirty-four inches in circumference at the level of the umbilicus. On the 9th there was profuse diarrhœa which continued until her death. At the autopsy the peritoneal cavity was found to contain two quarts of liquid, brown in colour and limpid in character. The legs were not dropsical. The peritoneum showed some small growths just like those in the pleuræ, but most developed on the diaphragmatic parietes and on the flanks, and only some very small patches on the intestine. The liver showed similar cicatrix-like spots on its surface, which by their contraction had caused depressions in the substance of the organ but had not penetrated the tissue. The liver was very fatty. The stomach showed a very remarkable appearance, its walls being half an inch thick and its interior looked as if encephaloid cancer were in the mucous membrane, which was generally pink in colour, much injected in parts and raised in relief over a greater part of its surface. This portion was rather irregular-looking from unequal prominence of parts. The outline of the changed part or parts was curved in growing. The pyloric fifth was the only part free, and it was chiefly in the middle three-fifths in adjoining and scattered patches. Sections showed the change to be chiefly in the submucous tissue which was white and very tough. The mucous membrane proper was over this and raised into mounds by it. Microscopical examination of the tough submucous tissue showed it to be fibrous, with no trace of cancer except a few cells embedded here and there which required much looking for. The tubes of the glandular layer were well developed, their nuclei large, and they were still close together though some bright nuclei were present between the tubes. In short, the stomach, except to the naked eye, did not appear to contain cancer generally. On the other hand, the colon, which had very much the same appearance as the stomach, except that there was hæmorrhage of old date into the cancerous growths, blackening them, had in its submucous tissue very well formed cancer tissue of the type of

carcinoma, approaching epithelioma in the quality of its cells. There were several patches of the same white growth in the ileum. Wherever it appeared the muscular tissue was thickened and the bowel contracted. The mesenteric glands were red and swollen and full of cancer. Those corresponding to the transverse colon were as large as chestnuts and had as much blood as in fungus hæmatodes. The mediastinal glands had a soft pink quality and showed cancerous deposit under the microscope very beautifully. There were in the pleura a considerable number of small scales of contractile or puckering character in the substance of the pleura having very little tendency to extend inwards, so that it rather formed little projections from the surface than grew inwards. The surface was drawn into folds near these and they had a stellate arrangement or form looking much like contracting scars. Some of them formed little fringes on the diaphragm. There were none in the substance of the lungs. There were similar small cancerous patches in the pericardium. The viscera generally were transposed, the left side of the body corresponding with what usually holds good on the right. The spleen was adherent in its bed. The gall-bladder was free from gall-stones and there were no cancerous deposits at the head of the pancreas. The kidneys were healthy. The ovaries were as large as walnuts, but under the microscope showed only fibrous tissue and a few cells. *See Insp.*, 1869, No. 34.

CASE 96. *Carcinoma of cardiac orifice of stomach. Secondary deposits in liver, lungs, and lymphatic glands. Pneumoniz.*—John R., æt. 58, was admitted under Dr. Fagge, and died on April 5th, 1869. At the autopsy, the body was found to be spare but not wasted. At the cardiac end of the stomach was a sore embracing or surrounding the whole orifice. It had strongly raised, thick edges, and extended through the whole thickness of the coats, so that they tore easily through. The stomach beyond was small and healthy. The glands about the stomach and liver were much enlarged; one of them of the size of a Tangerine orange had softened in the centre, and on section exuded a creamy liquid. The original cancer had a very great quantity of milky liquid, which flowed on section. The liver was large, and contained numerous secondary deposits in it. There were also secondary deposits in the lungs, which for the most part were in a state of hepatisation. The gall-bladder contained three or four small gall-stones, and the spleen weighed six ounces. The supra-renal capsules were embedded in cancer and partly invaded. They were coarse and fatty. The heart weighed ten ounces. On histological examination the growth in the liver was found to be a cylindrical-celled carcinoma, with scanty stroma, that in the stomach having more the character of a spheroidal-celled carcinoma. *See Insp.* 1869, No. 103.

CASE 97. *Carcinoma of the pyloric end of the stomach. Softening secondary deposits in cervical and gastric lymphatic glands, and in the liver.*—Rosa T., æt. 30, was admitted under Dr. Pavy on June 2nd, 1869, and died on June 8th. She was a lady's maid, who had been in Spain from just before Christmas. Previous to this she had been weakly, but fairly healthy. The catamenia were regular till she went to Spain; they then ceased and did not afterwards appear. She noticed a swelling on her return to England about the neck, which grew and burst, and discharged. There were many such swellings between the top of the sternum and the lower jaw. She lost flesh and grew very weak, and came back to England in March. She soon took to

bed entirely; grew very weak and thin. Not troubled with a cough. She seems to suffer most from the abscesses. Just below the ensiform cartilage in the middle line is a hard, roundish tumour, painful on pressure and quite immovable. The heart and lung-sounds were natural. At the autopsy the body was found to be extremely wasted, and in the neck were numerous enlarged glands, which were of doubtful appearance. In many respects they resembled scrofulous glands, but were thought on the whole to be cancerous, being similar in character to the glands in the lesser curvature, and in the gastro-splenic omentum, and similar also to some nodules of deposit in the liver. The pyloric third of the stomach showed a sloughing surface, forming a nearly complete ring around its interior, the incompleteness being at the lower border (greater curvature). This surface was dark, and obviously sloughing in parts. There was around it a raised, thick margin, composed of encephaloid cancerous matter, implicating chiefly the mucous and submucous tissues, but passing through to the muscular and peritoneal coats, so that it was easily seen from without, although there was scarcely any elevation on the outer surface. The affected part was contracted moderately. There was no hypertrophy of the remainder of the muscular wall. There was a very large quantity of blackish liquid in the stomach, evidently containing altered blood. The mucous membrane was dissolved entirely off the stomach. The contents were highly acid. There was no ulceration in the course of the alimentary canal. There was a considerable and most unusual quantity of fæcal matter in the colon and in the ileum. The spleen was softish and contained no cancer, but had a shrunken patch, evidently from old embolism. The supra-renal capsules were normal, the kidneys pale and somewhat scarred. The heart weighed five and a half ounces. The lungs were normal. See *Insp.* 1869, No. 158.

CASE 98. *Carcinoma of the pyloric half of the stomach. Secondary deposits in peritoneum.*—Anne H., æt. 48, was admitted under Dr. Wilks on April 28th, 1869, and died on July 5th. She had always been healthy until the present illness except that she had suffered from winter cough for two or three years with occasional slight hæmoptysis. For the last six months she has wasted much and has vomited nearly all her food. Latterly she has only taken milk. Over the apex of the lung dulness was observed on the left side. There was a hard, nodular, firm, movable tumour in the epigastrium, two inches from side to side, very painful and tender, and slightly tympanitic on percussion. June 4th, has brought up clots and streaks of blood, but insists on feeling better. Bowels not often opened, but once in two or three weeks. Worse, and great pain in the stomach. June 28th, no tumour evident for the last week. July 2nd, worse with intense pain. No food. Died July 4th at 8.35 a.m. At the autopsy the body was very much wasted and there was no trace of old disease in the lungs. The left lower lobe showed incipient broncho-pneumonia. The heart weighed five ounces. On opening the abdomen the stomach was seen with its pyloric half occupied by a growth. The pyloric quarter showed itself as shrunken to the size of the duodenum, whilst the next quarter was an indurated mass two inches broad, white on the surface, slightly nodular and having convex margins about which were small knots of the same growth. The transverse colon was drawn very close to the stomach here and was sealed to it by growth. The omentum extended down to the back of the bladder and adhered there. In it were

several nodules of the growth puckering it up. There were some in the mesentery, and especially over the sacrum where the ileum was tethered down to the root of the mesentery by extreme contractile puckering of that structure. The ileum here was very small. On opening the stomach a small ulcer about the size of a sixpence with its base formed of muscular tissue was seen over the site of the adhesions of the stomach to the transverse colon. The cancer seems to have grown more especially in the peritoneal and subperitoneal tissue. There were no secondary deposits except those in the peritoneum, and Dr. Moxon raises the question as to the propriety of using the term malignant in this case. Microscopical examination showed that the growth consisted almost entirely of fibrous tissue in great quantity. The peritoneal epithelium was full of fatty grains; in parts, however, there were a few clusters of insignificant cells with nuclei like those of gland epithelium. See *Insp.*, 1869, No. 179.

CASE 99. *Carcinomatous ulcer of pylorus, invading the pancreas and obstructing the bile duct. Secondary deposits in peritoneum and lymphatic glands.*—John H., æt. 45, was admitted under Dr. Habershon in August, 1869 and died on November 1st. He had had some vomiting in the earlier part of his illness. Latterly, after some months of gradual wasting and jaundice, he experienced severe pain on the right side of the hypochondrium. He sank rather unexpectedly, having been able to get out of bed the previous day. At the autopsy the body was found bent both forward and laterally, so that the chest was carried down in front, and the tumour had so been concealed. The body showed a moderate amount of jaundice, with a little œdema about the ankles. The stomach was much distended with two pints or more of beef tea, its walls thin and its contents acid, dissolving the mucous membrane, but not completely. At the pyloric end of it was a large excavation surrounding the pylorus and the neighbouring parts of the stomach and duodenum, so as to form a band of deep ulceration two and a half inches wide. The wall of the ulcer was half an inch thick, and the section of it showed two-fifths of it to belong to the mucous membrane, and two-fifths to belong to the muscular coat which was swollen and infiltrated with white cancerous matter. The base of the ulcer was chiefly formed by the pancreas, which was also charged with cancer to the depth of half an inch. The cancer had extended so as to press upon, but not invade, the common duct. The part so affected was about an inch above the duodenal opening of the duct, and half an inch in the course of the duct. The glands about the stomach and pancreas contained a moderate amount of malignant deposit. The lesser omentum had carried some nodules of it to the liver, where it was in the peritoneum only, however, no cancer growing in the hepatic tissue. The gall-bladder was enlarged to hold an ounce and a half of sepia-coloured bile, and was distended much with this. The ducts throughout the liver were a little implicated apparently, the organ itself being of a dark greenish colour. The lungs appeared to be normal; but the post-mortem examination was somewhat incomplete. See *Insp.* 1869, No. 286.

CASE. 100. *Carcinoma of the pyloric end of the stomach. Two carcinomatous ulcers in the colon. Secondary deposits in liver, peritoneum, and testis.*—Joseph V., æt. 55, was admitted under Dr. Rees on April 8rd, 1870, and died on April 7th. He was an engine-driver and was taken ill nine weeks ago,

having previously enjoyed good health. His first symptom was epigastric pain which extended to the chest, with vomiting. The matter vomited was dark brown and nearly black. The left leg and thigh began to swell a week ago. On admission the patient was emaciated and cachectic. There was an abdominal tumour to be felt. His pulse was 110. There was anorexia and sleeplessness. Purgatives were administered. He was taken afterwards very suddenly with severe abdominal pain and signs of peritonitis and died five hours afterwards. At the autopsy the thoracic viscera were normal, the lungs being free from cancer. The stomach was large and its muscles thick. The pyloric region was occupied by a great ulcer surrounding the stomach within, but deepest in the middle of the hinder aspect where it cut through the muscular coat for a well-defined area the size of a sixpenny-piece and there lay upon the pancreas. In this ulcer there was little sign of cancer, but the edges of it were raised and thick, and here the submucous tissue had a white, firm, fleshy growth in it, the muscular coat showing very little of this; but outside on the peritoneum were some nodules of malignant deposit and here the transverse colon was drawn to and fixed to the stomach. The whole alimentary canal was rather thick. The sigmoid colon showed a cancerous sore in appearance strikingly different from the ulcer of the stomach. Here was a soft creamy growth implicating all the wall of the bowel and easily broken down. The upper surface of it horribly sloughy. Above this was another cancerous growth of the mucous membrane, the size of a halfpenny-piece, grey and soft on its surface. The liver was everywhere stamped with cancer growths, the largest of the size of a great potato and the smallest of the size of a millet seed or even less. The larger were pasty within, the smaller fleshy throughout. The right testis had a nodule of cancer in the epididymis. *See Insp.*, 1870, No. 85.

CASE 101. *Carcinoma of the pyloric end of the stomach. Secondary deposits in lymphatic glands. Cirrhosis of liver. Suppurative nephritis.*—Valentine E., æt. 44, was admitted under Dr. Habershon on November 17th, 1869, and died on May 10th, 1870. Eight months before admission he began to have severe gastric symptoms, vomiting, and pain, especially in the epigastrium. On admission his chief symptom was for a long time loss of appetite. In January he vomited blood, on several occasions largely, after which he remained comparatively comfortable, having no pain, and sometimes making no complaint whatever, except of weakness and want of appetite, with extreme sallowness of the complexion. During the last four weeks of his life his legs and scrotum swelled up, and he suffered occasionally from difficult micturition and pain in the lower part of the abdomen. At the autopsy there was much œdema of the lower extremities, and the body was emaciated. The peritoneum was sodden-looking and dull, and contained a few flakes of lymph in the pelvis. There was a small slough visible at one spot, which proved to be the lower end of the pyloric portion of the stomach. A large tumour was seen rising from the hinder wall of the abdomen, which consisted of the pyloric third of the stomach and the surrounding parts, with the glands much enlarged by malignant deposit. When the stomach was opened, the primary disease was seen to be a great excavated cancerous sore occupying all the circumference of the pyloric third of the stomach, its edges raised and very abrupt, being composed of a ring of soft, juicy growth, triangular on section, with a rounded growing margin towards the healthy tissue. The base of the

sore at the greater curvature for three or four square inches was sloughy, being ragged, discoloured and foetid. The superficial part hung in shreds. This part was coated with grape-skins and pips. The surface of the sore, and of the stomach, had an alkaline action. The gall-bladder was large, but could be emptied by pressure. The liver showed marked cirrhosis; the kidneys showed many suppurating patches of the cortex extending through the pyramids, yet the ureters and bladder were healthy. The prepuce, however, was much distended and phimosed. The heart weighed seven ounces, and was atrophied. The thoracic viscera were free from disease. The lumbar glands contained secondary deposits. *See Insp.* 1870, No. 124.

CASE 102. *Carcinoma of stomach following upon a simple ulcer(?). Invasion of colon. Secondary deposits in peritoneum and pericardium. Ascites and pleuritic effusion.*—Thomas T., æt. 53, was admitted under Dr. Habershon in July, 1870, and died on August 27th. The patient was a hard-working, temperate man, who had been ailing with indefinite symptoms for some time before admission. Nothing, however, could be found on examination except chronic pleurisy with tenderness and pain about the false ribs and a great degree of tympanites. Ascites gradually supervened, with swelling of the feet, but the patient did not complain of any gastric symptoms until ten days before his death, when he said that his food hurt him and he vomited. No hæmatemesis. The right chest at the base was dull, and sounds somewhat like those heard over a cavity were once discovered. They were, however, thought to be due to the colon which the great tympanitic distension thrust up towards the chest. The hepatic dulness was rather narrow. The patient went into convulsions and died rather abruptly. At the autopsy the body was found to be much emaciated and the inferior vena cava was compressed by enlarged glands. These implicated the tissue around the solar plexus, "and," says Dr. Moxon, "no doubt by paralysing the sympathetic had produced the tympanites." The peritoneum contained about half a gallon of serous fluid with some flakes of lymph. The fluid had a specific gravity of 1008. It was evidently due to subinflammation. There was a mass of disease in the left epigastrium and hypochondrium. The tissues were adherent above and in front to the diaphragm so firmly that the diaphragm had to be removed here with it. The diaphragm was coated beneath with a layer of hard, milk-white growth that was pretty uniform over the parts just close to the growth. For about three inches radius all round it, its edge showed scattered tubercles "like skirmishers thrown out before an attacking army." This layer of peritoneal growth was gristly, hard, and juiceless, though its thickness reached an eighth of an inch. The liver was free from disease, but the gastro-hepatic omentum had some cancerous glands in it. The colon was adherent to the mass below though its course and structure were not much affected. On opening it up, however, it was seen that at one spot there was a serious implication causing a faint blackish discolouration the size of a shilling just opposite to the sloughing cancer of the stomach and a little more progress in the growth of the cancer would have led to communication between colon and stomach. In the wall of the colon at this point was a mass of cancer seen through the mucous membrane and raising it up into a tumour the size of a half cherry. There were also some smaller nodules in the neighbourhood apparently taking the place of the solitary follicles. The bulk of the tumour, which was externally the size of a moderate orange, was made up of a cancerous

growth in the middle third of the stomach. The interior of the stomach here showed an astonishing degree of increase, masses of black slough being in the interior of the stomach in the floor of a large ulcer, one mass as large as a chestnut; and there were several. But yet the floor itself was formed of cancer-formation an inch thick. Now on tracing up the coats of the stomach to this point it was seen that the mucous coat disappeared by an abrupt edge like that of a common ulcer, then the muscular coat ran on an inch and then ceased by an eroded edge as the muscular coat had done before. It was thought by Dr. Moxon that the growth had developed in a chronic ulcer. There were a few small cancerous glands in the pericardium; and there were three pints of effused fluid in the right pleural cavity, the right lung itself being carnified and completely airless. *See Insp.*, 1870, No. 206.

CASE 103. *Carcinoma of the pyloric end of the stomach. Secondary deposits in gastric lymphatic glands. General dropsy. Calcareous mesenteric glands.*—Rachel B., æt. 47, was admitted under Dr. Habershon on October 19th, 1870, and died on November 10th. She had suffered for more than a year from severe sickness. Latterly her symptoms became comparatively insignificant, and dropsy set in two months ago. On admission there was no albumen in the urine, and no abnormal heart-sounds. She was very feeble, and died rather suddenly. At the autopsy there was great œdema of the lower extremities, and both pleural cavities contained fluid, the lungs being collapsed. When the abdomen was opened there was a large quantity of ascitic fluid, which was of a distinct milky, sub-opaque white colour. The mesenteric glands showed, many of them, calcareous changes, "which," says Dr. Moxon, "was curious in respect of the milky nature of the fluid effused into the peritoneal cavity." The stomach was very large and contained a quart of food mixed with altered blood. The coats were everywhere hypertrophied. A portion of the organ is preserved, and forms Museum Preparation 710, thus described:—"A portion of a stomach, originally mounted as an example of spindle-celled sarcoma of the pylorus. The pyloric extremity of the stomach is encircled by a growth, which extends from the duodenum four inches towards the body of the organ. The mucous membrane is stretched over the thickened area, the margin of which is well defined. The growth is situated chiefly in the sub-mucous tissue, and is in parts half an inch thick, the muscular coat being also somewhat hypertrophied. Histological examination of the adventitious material shows it to consist of well-formed fibrous tissue, while in the periphery of an adjacent lymphatic gland there were found small alveoli filled with spheroidal epithelial cells." The heart and spleen weighed, each of them, five ounces, and there were no secondary deposits. *See Insp.* 1870, No. 263.

CASE 104. *Villous carcinoma of the lesser curvature and posterior wall of the stomach invading the liver. Perforation of stomach. Peritoneal abscess.*—Elizabeth C., æt. 56, was admitted under Dr. Owen Rees, and died on January 20th, 1871. The date of her admission is not given. Whilst carrying a tub of water the patient felt something snap on her left side causing pain and faintness. She was obliged to lie up, and vomited coffee-ground like matter for a week. Has vomited a similar kind of material once a fortnight up to the present time. She vomits half an hour after all food taken. She suffers great pain in the epigastrium and hypochondrium. October 14th,

pain in the epigastrium somewhat relieved by the application of leeches. November 7th, diarrhoea checked by mistura hæmatoxyli. 10th, great pain. 19th, attack of diarrhoea. She gradually sank, the diarrhoea continuing more or less to the end of her life. At the autopsy the body was exceedingly wasted and the left lobe of the liver was found firmly adherent to the stomach by a quantity of areolar tissue. There was, however, no adhesion of the stomach to the abdominal parietes. The stomach contained about a pint of liquid of which about half was blood-clot. Some loose pieces of villous cancer were present in the gastric contents and floated out in water; they were very easily recognized. The stomach had in the lesser curvature, more on the hinder than on the anterior wall a large cancerous patch with raised flocculent edges one inch thick. This thick edge was composed of villous growth. The centre of the patch formed a deep excavation and entered the liver and also communicated with an isolated and enclosed part of the lesser peritoneal space; the cavities thus formed in the liver and peritoneum being sloughy and fetid. The abscess outside the liver reopened into the duodenum by a ragged aperture just beyond the pyloric valve. The excavation in the liver substance had for its wall a thick layer of cancerous tissue. The rapid growth of the cancer in the liver compressed it and produced a stretched and decolorized tough zone around the cancer, and outside this a brown layer of not more than half an inch in thickness which was all that remained of the liver at the middle of the left lobe. There was no secondary cancer in any part of the body. The intestines were full of blood but had no disease. The liver was very fatty, the spleen, lungs, and kidneys, normal. The growth, examined histologically in 1891 was found to be a cylindrical-celled carcinoma. See *Insp.*, 1871, No. 23, and Prep. 679.

CASE 105. *Carcinomatous stenosis of the pylorus*.—Matthew W., æt. 53, was admitted under Dr. Habershon on April 26th, 1871, and died on May 5th. He was a bricklayer, of temperate habits, and was said to have been ill only seven weeks. At that time he lost his appetite, and he has since been getting worse. Three weeks ago he vomited about a quarter of an hour after his meals, and he has vomited three or four times a day since. The vomiting varies from ten minutes to three hours after food. Bowels constipated. On admission, pain and vomiting, the pain preceding and being relieved by the vomiting. The patient is faint and weak, and suffers much from thirst. No tumour. The visceral secretions natural, save for constipation. The vomiting proved quite uncontrollable, and he grew weaker and sank. At the autopsy the nourishment is noted to have been remarkably good for this disease. The peritoneum was normal, except for a few secondary deposits over the gastric tumour. The stomach was very large, its walls very thick, and increasing towards the pylorus, so that near the growth the muscular coat was one-eighth of an inch thick. The mucous membrane also appeared thicker than natural. There was very complete pyloric obstruction. There was a ring around the pylorus one and a half inches broad, depressed in the middle as viewed from within, and raised as to the edges of the ring. This closed the orifice so that it would about allow a goose-quill to enter. But on the gastric side there was another such depressed cancerous patch with raised, thick, rounded edges placed on the lower aspect, and so near the pylorus that its raised edge closed the little opening, which remained, like a valve. The stomach contained a quantity of yellowish fluid. The duodenum had in

dark, yellow-brown, bilious matter. The small intestine was nearly empty and shrunken, the colon large, and containing flatus. There were no lymph glands implicated. The gall-bladder was full of dark-coloured bile; the liver, spleen and kidneys were healthy. The heart weighed nine and three-quarter ounces, and there was a little recent pleurisy on the left side. See *Insp.* 1871, No. 131.

CASE 106. *Diffuse carcinoma of the stomach. Ischio-rectal abscess. Sloughing of scrotum. No secondary deposits.*—William A., æt. 51, was admitted under Dr. Habershon on July 12th, 1872, and died on August 20th. No malignant disease in his family. His illness began a week before Christmas since which time he has suffered from pain in the abdomen, chest and back, with sickness and loss of appetite. On admission, a nodulated swelling was detected below the left ribs, painful to the touch. On August 12th, an abscess formed in the ischio-rectal fossa. He gradually sank with diarrhoea and asthenia. At the autopsy, the body was much emaciated and the heart was found to weigh seven ounces. The left lobe of the liver was adherent to the anterior wall of the stomach, and a portion of the colon was adherent to the cardiac end of the stomach. The whole of the interior of the stomach from the œsophagus to within three inches of the pylorus was covered with cancer, which projected in the form of nodules or large spikes towards the interior, so as almost to fill up the cavity. There were no secondary deposits in any other organ. The liver structure was normal and in it was found a cretaceous hydatid. The gall-bladder was also normal and the glands were healthy. The kidneys were healthy. There was a perineal abscess which did not communicate with either the bladder or the rectum. The scrotum had sloughed and exposed the testes but the testes themselves were healthy. See *Insp.*, 1872, No. 212.

CASE 107. *Sarcoma of the pylorus.*—William W., æt. 66, was admitted on July 3rd, 1872, and died on September 3rd. He was a stoker, in the habit of gin drinking. He had vomited his food for three or four months before admission. On admission his principal symptoms were emaciation and vomiting. There was no albumen in the urine. At the autopsy, made by Dr. Goodhart, the body was much emaciated and slightly jaundiced, the heart weighing seven ounces. There was recent hypostatic pneumonia at both bases. The aorta was dilated and calcareous in parts. The cavity of the stomach was large and the mucous membrane healthy. The pylorus was thickened and patent. On opening it up the surface of the mucous membrane was found injected, swollen and ulcerated. A section showed a new growth attacking muscle and mucous membrane, of yellowish look and firm consistency, yielding no milky juice when scraped. Histologically the growth was a round-celled sarcoma with the intervening connective tissue of a fibrous nature. The liver weighed forty-six ounces, and was free from secondary deposit. The gall-bladder was distended but there were no gall-stones. See *Insp.*, 1872, No. 219.

CASE 108. *Sloughing cancerous ulcer on posterior wall of stomach. No secondary deposits.*—Matthew J., æt. 61, was admitted on May 27th, 1872, and died on September 8th. The patient had enjoyed good health till eighteen months ago, with the exception of an attack of rheumatic fever thirty years ago. His illness began with general malaise, and on admission he was found

to be considerably wasted. There was evidence of emphysema. The urine was free from albumen. His principal symptoms were vomiting of food and pyrosis. He died from gradual exhaustion, and at the autopsy the body was found to be extremely emaciated and the heart weighed seven and a-half ounces. The posterior wall of the lesser curvature of the stomach was occupied by a large fungus nodular growth, very soft and succulent, exuding a thick, creamy juice and rendering indistinguishable the various coats of the stomach. The muscular and mucous coats seemed to have disappeared at this spot. The surface of the growth towards the centre was sloughy-looking, with portions almost detached, and at its circumference only did active growth appear to be going on. There is a diagram of the growth showing that it is semi-circular in outline, the diameter of the semi-circle occupying nearly the whole of the length of the lesser curvature. The growth, as above stated, is on the posterior wall of the organ. There were no secondary deposits. The gall-bladder was full, the liver weighed thirty-eight ounces, and the liver, kidneys, and spleen, were healthy. See *Insp.*, 1872, No. 227.

CASE 109. *Carcinoma secondary to simple ulcer of the lesser curvature of the stomach.*—Andy C., was admitted under Dr. Moxon in 1872, having been brought by the police to the hospital. He was a labourer, who had fallen in the street, through pain and faintness. On admission, he was collapsed, and suffered pain in the left hypochondrium. His knees were drawn up, but the abdomen was not tender. He did not rally, and died about 3 o'clock the next morning. The patient said that he had been ill for six months, and during that time he had been unable to keep his food down. He suffered pain, and latterly his food returned immediately he had swallowed it. At the autopsy, the body was that of an aged man, wasted, and with grey hair. The alimentary canal contained some dark coloured material, evidently with blood in it. There was no peritonitis. The stomach was full of large clots of blood, and there was a large ulcer in the lesser curvature, circular, and three inches in diameter. The edges were raised, sharply defined, and callous. The base was composed of the pancreas and of condensed sub-peritoneal tissue. The bleeding had proceeded from an artery above the pancreas. The ulcer itself did not offer any appearance of cancer, but there were cancerous nodules around, especially near the œsophagus, the attachment of which to the stomach was somewhat constricted. There were no secondary deposits. See *Insp.* 1872, No. 271.

CASE 110.—*Carcinoma encircling the central portion of the stomach. Extensive peritoneal adhesions. No secondary deposits.*—Annie C., æt. 45, was admitted under Dr. Habershon on November 27th, 1872, and died on December 25th. At the autopsy the body was somewhat emaciated and there was œdema of the legs. Both pleural cavities contained a small amount of fluid and there was pleurisy on the right side. The heart was small. The intestines were much matted together round the stomach with the omentum, so that the peritoneal cavity was quite obliterated at this part by the viscera being adherent together. These viscera again were adherent to the abdominal wall and it became necessary to turn out the liver, spleen, left kidney, stomach and much of the intestines together. On dissecting off the abdominal wall from the mass the muscle was found to be much wasted, flabby and pale whilst its under surface was attached by some

succulent and fleshy growth. Beneath this came a piece of large intestine (transverse colon) matted up with the omentum, and on stripping off this a large gap was found in the anterior wall of the stomach, the edge being ragged and frayed out, although the adjacent coats of the stomach were much thickened. On opening up the stomach a large ulceration was found situated on the lesser curvature closer to the œsophagus than to the pylorus, and measuring about three inches across. It encircled the stomach, broadening out towards the lesser curvature. The growth had destroyed the anterior wall in an area of some three inches. The base of the ulcer was formed by matted, fibrous-looking tissue and a thick, white, but not very juicy, cancerous growth. The edges of the mucous membrane adjacent to the ulcer were thickened to the extent of two lines by the same cancerous material. The thickening extended some way from the ulcer's margin and in places had only attacked the mucous coat. In others it had attacked all the coats, but for the most part the lines of separation between the various tissues, muscular, mucous and submucous, could still be seen. There were no secondary deposits. The liver was very fatty but otherwise healthy. The spleen was adherent to the cancerous stomach and the adhesions contained some new growths, but the gland itself was normal. The kidneys were pale and fatty, the capsules were very adherent and separated only by tearing. See *Insp.*, 1872, No. 342.

CASE 111. *Carcinomatous stenosis of pylorus. Extensive peritoneal adhesions. Secondary deposits in glands and liver.*—William B., was admitted under Dr. Pavy and Dr. Fagge on March 19th, 1873, and died on April, 28th. Four years ago the patient suffered from epileptic fits and his skin has since become darker. His swarthy colour has deepened since an accident five weeks ago. He fell on his head from a ladder and was rendered insensible. Blood oozed from his ears and was afterwards mixed with some watery discharge. This continued to flow for two days. Since the accident he has occasionally lost his senses. He has wasted lately and has been unable to keep anything on his stomach except beef-tea. On admission the abdomen was tumid and he complained of intense, sharp pain over the pylorus. Vomits his food about three hours after taking it. April 19th, marked ascites, bowels not opened for eight days; splashing in abdomen. Occasionally in the epigastrium a hard mass forms in which peristaltic waves can be seen. This is close to the ribs; it is resonant on percussion. The splashing seems to be lower in the abdomen. Vomits large quantities of brownish fluid; no *sarcinæ*. 23rd. Four pints vomited. 24th. Two pints of dark, turbid fluid. No tenderness anywhere particularly. 25th. Vomit black, bowels not opened for fifteen days before death. At the autopsy the body was much wasted and of an extremely dark colour, like the skin of a mulatto. There was a fracture on the right side of the base of the skull which had undergone almost complete repair. Dr. Fagge remarks, "The diagnosis was at first that his vomiting might have been central, from fractured base." This was when he was an out-patient under Dr. Fagge. Afterwards scirrhus pylorus was thought of. Subsequently it was observed that the distended mass in the epigastrium was not in the ordinary position of a chronically dilated stomach. It was thought that it might be a dilated transverse colon, and especially as the peristalsis was from right to left. It was therefore surmised that the obstruction might be in the sigmoid flexure, accounting for the obstinate constipation, but

Mr. Howse found the rectum full of fæces. It was therefore thought that the stomach itself was the seat of the disease but adherent to the parietes so as to be unable to descend. There were some small flat white growths on the pleura. The peritoneum contained much cancerous growth scattered in minute flat grains over the intestines, and in rounded grains over the omentum. In the omentum it also ran along the vessels in a marked way. The omentum was stretched downward and adherent to the parietes just below the left inguinal ring. There was no indication that there had ever been a hernia. The liver was excessively adherent to the diaphragm and anterior abdominal wall. All the parts on the under surface of the liver were adherent together. The pancreas and the glands, which last themselves were cancerous, were embedded in this mass. Some other bands of adhesions passed from the stomach up to the diaphragm. The mesentery was greatly shortened. The lower end of the ileum was adherent to the parietes within the pelvis. The stomach contained a cancerous growth at the pylorus which was proved to be cancer by histological examination. The pylorus was so narrowed that a finger would not pass, and was drawn upwards towards the liver so that it looked upwards and downwards. The growth extended through the mucous membrane where it formed a raised, vascular mass with red points that had evidently been the source of the hæmorrhage during life. The muscular coat of the stomach was greatly thickened. Its cavity was enlarged, chiefly in the direction of its length. The puckering up of the lesser omentum prevented the stomach descending; therefore its left extremity got tilted upwards beneath the ribs, pushing up the left ala of the diaphragm. The mucous membrane of the stomach was thrown into longitudinal rugæ. The other abdominal viscera were generally healthy. The liver had in its left lobe a mass of white growth running along one of the portal canals from the hilus. The other portal canals contained no such growth. The glands in the portal fissure were enlarged and cancerous, containing large cells with large nuclei. The right suprarenal capsule was healthy, the other escaped notice. The kidneys were healthy. See *Insp.*, 1873, No. 124.

CASE 112. *General infiltration and contraction of stomach from carcinoma. Secondary growth in peritoneum. Ascites. Gangrenous broncho-pneumonia.*—Anne D., æt. 62, was admitted under Dr. Pavy, on March 5th, 1873, and died on May 17th. About seven months ago the patient began to suffer from pain on both sides and over the liver. Her urine was scanty. Three weeks ago she first noticed a swelling the size of an egg in the left iliac fossa. On March 10th, vomiting came on with great abdominal pain, the abdomen being often much distended with flatus. March 31st, passes her motions in small nodules, with pain. April 7th, vomits almost everything; fluid in the peritoneal cavity. April 22nd, feet slightly cedematous. May 5th, drowsy, passing her motions and urine into the bed. At the autopsy the body was much emaciated. The lower part of the right lung was in a state of consolidation from broncho-pneumonia, and some of it was on the point of sloughing. There was a little old phthisis, with cheesy deposit at both apices. The heart weighed five and a half ounces, and was healthy. The peritoneum contained a large quantity of fluid. When this was allowed to run away, the viscera were seen lying on the centre and back of the abdomen, isolated from the parietes, and from one another. Thus the liver retained its position, and was quite an inch from the right ribs. Its capsule was thick;

but its tissue was healthy, except that it was fatty. It weighed thirty-four ounces. The gall-bladder contracted, containing only white mucus. Great contraction of the lesser omentum, so that the apex of the gall-bladder was close to the ductus communis choledochus, and this puckering seems to have been the cause of the obliteration of the cystic duct. The ductus communis choledochus did not seem to be larger than natural, but the ducts within the liver seemed to be somewhat larger in proportion to the portal veins than usual. There was no obstruction to the entrance of bile into the duodenum. The stomach was very small, and reduced so that it would hardly have held more than a few ounces. Its coats were greatly thickened. On section it appeared that the thickened coat was the submucous one. This was in places quite a quarter of an inch thick. Outside this was the hypertrophied muscular coat and outside this again a slightly thickened subserous coat. In places the change in the submucous tissue infiltrated the mucous coat producing white elevations visible on the interior of the organ, but there was nowhere any ulceration. The disease was more marked towards the pyloric end of the stomach the cardiac end being free, but the pylorus itself had escaped. It formed a very definite soft ring and the commencement of the duodenum was drawn backwards and inwards so as to be approximated towards the posterior surface of the stomach. All parts of the intestine were much puckered. The small intestine pressed in and packed at the centre of the abdomen. The muscular coat seemed generally much thickened and on the serous coat there was growth, thickening it in small spots and patches. The mucous coat was everywhere thin. The large intestine was also contracted in the transverse colon; and also in the sigmoid flexure and rectum the gut was several times bent on itself so that there was considerable difficulty in making the enterotome enter it. The appendices epiploicæ were puckered up forming little yellowish tumours. The spleen and kidneys were healthy. The heart weighed five and a half ounces and was healthy *See Insp.*, 1873, No. 148.

CASE 113. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver and lymphatic glands. Peritonitis.*—James T., æt. 34, was admitted under Dr. Wilks in April, 1873, and died on May 28th. The patient was said to have been only three months ill. He vomited much, and a tumour on the liver was recognised; but from the acuteness of the symptoms it was doubtful whether the enlargement was not due to suppuration. He died abruptly when he had not previously shown signs of being near to death. At the autopsy the body was not much emaciated and general suppurative peritonitis was present. A moderate extent of pus-formation not quite characteristic. Some lymph also about the liver, which was adherent by semi-recent formations over one or two of the cancers. The stomach was found to show a great cancerous sore surrounding the pyloric end of the stomach for a distance of about two inches. Its edges were raised much and these as well as the base were thick with soft creamy cancer, chiefly formed in the submucous tissue, but involving the muscular coat at the centre of the sore. No other cancer in the alimentary canal. The liver was very much disfigured through the development of immense quantities of cancerous tissue. This had the usual distribution of secondary cancer, so that it stood in small rounded masses scattered chiefly in the superficial part of the tissue. There was a good deal of nutmegged liver near and between these cancerous masses. No gall-stones. There was

cancer in the glands of the portal fissure. The spleen was free from cancer, the lungs also, the heart healthy and the kidneys healthy. See *Insp*, 1873, No. 167.

CASE 114.—*General carcinomatous infiltration and contraction of stomach. Secondary deposits in mesentery and ovaries. Contraction of small intestine. Peritonitis.*—Anne N, æt. 51, was admitted on May 14th, 1873, under Dr. Moxon, and died on June 10th. She was a married woman of temperate habits. Three months ago she began to suffer from pain in the middle of the back and in the chest after food, with flatulence and constipation. For about two months the abdomen had been getting large and hard. A fortnight ago her legs began to swell. On admission her face was pallid, but there was no jaundice. The abdomen was distended with fluid and dull all over, the superficial veins enlarged, legs oedematous, bowels open. Very little pain in the abdomen. The urine contained no albumen. 21st. The liver cannot be felt; temperature 100·5; pulse 134; has taken hardly any nourishment. 25th. For the last day or two has complained of sharp pain catching her breath over the lower ribs. Pain also in the epigastrium relieved by pressure. 28th. Whole abdomen very tender; bowels confined; sits up as she cannot lie in bed; temperature 101°, pulse 144. 20th. Dr. Moxon believes the affection to be carcinomatous. June 3rd. Passed in her motions blood of very dark colour; very little pain. June 4th. Pulse 122, very weak; copious greenish and slimy stools. 6th. Vomiting stercoraceous. At the autopsy the legs were anasarcaous but the wasting of the body was not extreme. The stomach was found to be greatly diminished in size. "I do not," says Dr. Fagge, "think it would have held half a pint." Its coats were greatly thickened, especially the mucous and submucous coats. The mucous membrane was pale in some parts but did not seem to have any growth invading it. The pyloric ring was well marked and the commencement of the duodenum formed a cul de sac posteriorly approaching the stomach behind the pylorus. The peritoneum contained a large quantity of very dark, purple, greenish-brown liquid. When this had escaped the intestines were seen lying in a heap in the centre of the abdomen adherent together by recent soft lymph which could be broken down without much difficulty. The intestines were of an intense dark purplish colour, as much so as if they had been strangulated, but this colour was universal, even the large intestines being of nearly as dark a tint. The parietal peritoneum was also very dark but rather of a slaty hue. Over the liver there was a good deal of soft, dirty-looking fibrin. There was very little indication of cancerous growth in the parietal peritoneum. The omentum was puckered up into a rounded lump just below the stomach, and on cutting it across a little white material, apparently new growth, could be seen here and there between the particles of fat in its substance, and just below the stomach an oval white body, the size of an almond, apparently a lymphatic gland, had a white, shiny surface on section, evidently due to the presence of the same morbid material. The small intestines were much narrowed by the thickening of the peritoneum over them, but particularly by the presence of a mass of new growth along the mesenteric attachment in its whole length. This could be felt as a hard cord in the free edge of the mesentery, and on opening the intestine it was seen that the mucous membrane was adherent along this line so as not to be movable over the other coats. The liver was fatty, the spleen soft and

healthy, the kidneys, which weighed ten ounces, were apparently diseased, the cortex being thin and narrow and the structure blurred. The ovaries were both of them somewhat enlarged, and contained a similar white growth to that in the intestine. The extremities of the Fallopian tubes contained masses of a similar growth and in one case this extended to some distance up the tube. The left tube was bent backwards and adherent to the rectum; the right was adherent to the ovary. See *Insp.*, 1873, No. 183.

CASE 115. *Carcinomatous stenosis of pylorus probably secondary to a simple ulcer. Secondary deposits in glands and in omentum.*—John D., aged 48, was admitted on March 25th, 1874, and died on March 31st. He said that he had been healthy up to February 1st, when he vomited four hours after his dinner. After this the sickness returned every second or third day. He had never vomited blood. Bowels always costive. Since the beginning of March he has had rumbling pains after eating, relieved by eructation. For the last six years he has taken about six pints of beer daily. Nothing could be felt in the abdomen except that the liver reached down to the umbilicus. The rectus muscles were very rigid. Cancer of the stomach was thought to be likely. The movements of the organ could be seen through the parietes. He became delirious on March 30th, and died on the 31st, slightly convulsed. At the autopsy there was no general cancer of the peritoneum, but small nodules of growth were spread on both surfaces of the stomach over the lesser curvature and there was also commencing cancer on the omentum. The stomach was found to contain a great quantity of cancerous growth which completely surrounded the pylorus, narrowing it so that it would just admit the little finger. It also extended some distance along the lesser curvature surrounding a smooth-walled ulcer which occupied this position and which looked very much like an ordinary chronic ulcer. It had its long axis transverse and consisted of two distinct rounded portions united by a narrow arch. A gland in the lesser curvature was distinctly cancerous. None of the other viscera were cancerous. The liver was healthy, the intestines dark, and they apparently contained much fecal matter. The heart weighed eleven ounces and was not wasted. Dr. Fagge remarks that it is to be regretted that the brain was not examined, for the emaciation of the patient was but slight and the progress of the case was so rapid that death could hardly have been due simply to the abdominal affection. See *Insp.*, 1874, No. 117.

CASE 116. *Carcinoma of the pylorus. Secondary deposits in lymphatic glands.*—Alice W., æt. 52, was admitted under Dr. Habershon on May 7th, 1874, and died on August 12th. She was admitted with pain in the stomach and a tumour, and afterwards had hæmatemesis. She died very gradually. At the autopsy the tumour was found to be a cancerous mass about the size of a fist, which occupied the pylorus. The stomach was small and its walls very thin up to the edges of the diseased part. This when laid open proved a large ulcer with shredded sloughy surface and very thin raised cancerous edges. There was no obstruction, the orifice being many times larger than natural. There was secondary disease of the glands along the lower part of the aorta, none in any of the viscera. The kidneys were very pale and the cortex wasted and mottled. They weighed twelve ounces. See *Insp.*, 1874, No. 299.

CASE 117. *Carcinoma of pyloric end of stomach.* *Secondary deposits in liver. Acute peritonitis.*—Anne V., æt. 50, was admitted under Dr. Moxon on September 15th, 1874, and died on December 16th. She was a married woman with three children. Eighteen years ago she had suffered from rheumatism in her arms. Some months ago she noticed that she passed blood with her motions. Five weeks ago she had a fainting fit, and vomited about half a pint of blood. On admission the skin was dry and yellowish, and the bowels constipated. The liver was somewhat enlarged, the lungs normal. The heart's impulse was weak, and there was a loud systolic bruit at the apex. The urine was free from albumen. There is a hard, painful swelling a little to the left of, and about an inch above, the umbilicus. A distinct pulsation over the swelling. Motions contained blood. She complained of great pain in the abdomen on November 20th. On November 22nd there is a large flattened mass in front of the aorta. Her temperature rose to 105° the day before her death, falling to 101° shortly before that event, which resulted from gradual exhaustion. At the autopsy, the body was emaciated, and presented a sallow hue. There was recent peritonitis, especially over the coils of small intestines below the umbilicus and along the right side of the diaphragm. The inflammation was of a rather intense form. The liver was down half way to the umbilicus, and of a rather tight-laced shape. The gall-bladder was obliquely situated near to the median line, and together with that part of the liver to the left of it, was pushed forward by some mass behind it. The pylorus lay between the left lobe of the liver and the gall-bladder in the notch formed there near the median line, and the stomach, which was very contracted, ran under the edge of the liver into the left hypochondrium. The transverse colon came immediately below it, also very contracted. The stomach was first laid open, and a large ulcer exposed at the pyloric end, occupying the whole of the pyloric portion, and extending into the stomach proper for a short distance. The edges were somewhat rounded and thickened from the new growth; but there was no evidence of any old ulcer leading to cancer. The floor of the ulcer was formed by soft growth, which extended thence along the lesser curvature of the stomach. It was much of it sub-peritoneal, so that on section the peritoneum was seen to be considerably thickened. Immediately to the left of the pylorus the tumour was so soft that it was nothing more than a cyst of chocolate-coloured fluid, which occupied a cavity formed by the under surface of the left lobe of the liver, the stomach and gall-bladder. This cyst had opened anteriorly into the peritoneal cavity, and had thus set up the peritonitis. The peritoneal cavity contained some ounces of a turbid fluid of a yellowish-red colour. To the left of the cyst was another nodular white growth beneath the mucous membrane of the stomach, and a smaller nodule was seen below the pylorus, close outside the wall of the primary growth. The edges of the ulcer contained some recent blood-clot, and there was some recent hæmorrhage into the cavity. The coats of the stomach, apart from the parts thus described, were quite healthy. The tissues in the portal fissure were fleshy, but free from growth. The bile-duct was normal, and the portal vein also. An artery, either the pyloric or a branch of the gastro-duodenal, was found full of clot, and a probe being passed along, this artery was found full of cancerous thrombus. The liver contained one large secondary deposit about half an inch in diameter on the under surface of the left lobe, and this growth was very soft, composed of a pulp similar to that in the cyst above described between the liver and stomach.

The left lobe had also a nodular growth in it. The liver, which weighed sixty-eight ounces, was fatty. The gall-bladder was distended, but free from gall-stones. The spleen weighed eleven ounces, and was very firm. The heart, which weighed twelve ounces, showed hypertrophy of the left ventricle, with slight thickening of the aortic valves. The kidneys were affected with interstitial nephritis, and there was a considerable degree of atheroma of the aorta. *See Insp.* 1874, No. 476.

CASE 118. *Carcinoma of the lesser curvature of the stomach. Liver much enlarged by secondary growth. Deposits in lymphatic glands.*—A woman, name and age unknown, was admitted under Dr. Braxton Hicks and died on December 25th, 1874. In the previous April she had an illness, during which she suffered much pain and was jaundiced. In May she miscarried, since which time she has suffered from pain in the chest and abdomen, has lost flesh and has also had for a similar time nausea after food. She first began to vomit three weeks before admission. On admission, there was found continuous with the liver a rugged uneven mass extending to the level of the umbilicus and reaching into the left hypochondriac region. The other viscera were normal. Sickness persisted; she became gradually weaker and two days before her death became slightly jaundiced. At the autopsy the body was much emaciated and the lungs were slightly collapsed. At the posterior part of the stomach near the lesser curvature was a circular ulcer about three inches across, with a raised margin forming an irregularly elevated crescent. The central part was not depressed below the level of the surface of the stomach. The ulcer was implanted on a base of firm white material, extending to the peritoneal surface and infiltrating the coats of the organ. A milky juice could be scraped from it and it was evidently the scirrhus form of carcinoma. The pelvic organs were normal. The liver weighed eleven pounds twelve ounces, and was for the most part replaced by large masses of cancer, the centres of which had broken down into soft, cheesy, semi-fluid material, the intervening hepatic substance being evidently fatty. The gall-bladder contained normal bile, and there was no obstruction to its flow through the duct into the duodenum. The glands around the curvature of the stomach were infiltrated with cancer; the spleen weighed six ounces, and was normal. The heart weighed eight ounces, was pale and flabby, and the kidneys also were healthy. *See Insp.*, 1874, No. 488.

CASE 119. *Carcinoma of the pyloric end of the stomach. Infarction of coronary artery of the heart. No secondary deposits.*—Pereker B., æt. 60, was admitted on March 17th, 1875, and died on March 31st. He was a medical man who had lived in New Zealand for seven years. He has had children's diseases but no other ill-health. For the last two years he had practiced in England. He has not drunk spirits or any liquor to excess. Just before Christmas he became dyspeptic and vomited his breakfast. He gave up certain articles of diet and got better. In the beginning of February sickness recommenced and still continues. He has lost two stone in a fortnight. Anxious-looking, slight jaundice. No pain in the abdomen. No physical signs of disease in the abdomen or chest. Urine 1028, no albumen. Temperature 98·4°, pulse 76. March 22nd. A diffused lump across the epigastrium part of which descends during inspiration. He is still very sick. Abdominal muscles flaccid; much wasted. He remained in

much the same condition with constant vomiting and died exhausted. At the autopsy the hair was still dark though turning grey about a bushy beard. Dr. Goodhart remarks, "He has worn well for sixty and a doctor." The lungs were emphysematous and the branches of the pulmonary artery within the lungs were large and thick. There was ulceration in the larynx, probably of the decubital character. The heart showed a large patch of infarction in the left ventricle and there was localized pericarditis corresponding to this patch, with an ante-mortem thrombus in the cavity of the left ventricle. On opening the abdomen nothing abnormal could be seen. The liver came well down in the median line and covered over the pancreas and stomach entirely towards the pyloric end. Indeed the stomach was small and very little of it could be seen. On lifting up the edge of the liver the pyloric half of the stomach was seen underneath the left lobe, contracted but much thickened, and with its peritoneum over it tuberculated from the presence of numerous white nodules of cancer. The stomach was of an elongated shape, without much distinction as to size between cardia and pylorus. The pylorus looked swollen out and tense, while the cardiac end was flaccid. On opening its cavity some dark green, very offensive, ropy, mucoid material was evacuated to the amount of two or three ounces, and the coats of the stomach over the area indicated were found to be enormously thickened by new growth. There was no direct obstruction anywhere but the thickened coats and contracted cavity were sufficient to account for the non-passage of the food and the obstinate vomiting. The inner surface of the stomach towards the pylorus was converted into a vascular, shaggy, ulcerated, cancerous surface, which on vertical section gave no indication now of either mucous, muscular, or other coats. The whole thickness of the wall at any one part was about half an inch and was made up of a whitish growth which appeared to be rather firm but on palpation was found to be soft, and to present numerous opalescent-looking spots in it, as in colloid material. Under the microscope it was made up of delicate connective tissue, like myxoma, enclosing, though not in very definite alveoli, very large granular cells. There was no evidence as to where the tumour had commenced, but Dr. Goodhart thinks that from the nature of the growth and its infiltrating character it may have begun in the connective tissue or the muscular coat rather than in the mucous coat, or possibly even in the subperitoneal tissue. The liver weighed forty-six ounces, and was free from secondary deposit. The gall-bladder was distended but not obstructed. There were no secondary deposits in the glands. The spleen weighed five ounces and was healthy. There was a single kidney, the right, which weighed twelve and a half ounces, and lay across the spine somewhat after the manner of a horse-shoe kidney. The ureter was single and normal except that there was no cavity for the pelvis, but the ureter was formed by the coalescence of several tubes. There was no opening in the bladder for the left ureter. See *Insp.*, 1875, No. 124.

CASE 120. *Carcinoma of pylorus. Secondary growths in peritoneum with sanguineous ascites. Deposits in abdominal lymphatic glands.*—George D., æt. 20, was admitted under Dr. Wilks on March 27th, 1875, and died on April 1st. The patient had always been healthy except for occasional attacks of quinsy till four weeks ago when he noticed tightness of his chest and gradual enlargement of the abdomen. He also suffered from constipation,

flatulence, and acid eructations. The penis and scrotum began to swell three days before admission. On admission, the patient lies with his legs drawn up and evidently in much pain. Face anæmic, body emaciated, abdomen globular and distended, dull in front and at the sides. Superficial veins distended: urine 1034, free from albumen. On the 30th paracentesis of the abdomen was performed and sixteen pints of fluid containing blood were withdrawn. The bloody character of the fluid led to the suspicion that there was malignant disease. At the autopsy the peritoneal cavity contained no considerable amount of fluid but there was evidence of commencing peritonitis. The stomach was decidedly larger than usual, the intestines moderately distended and the mesentery not shortened. The omentum was converted into a soft mass of cancer, very vascular. Soft nodules of growth existed in many parts of the peritoneal cavity, especially on the under surface of the diaphragm and in the flanks, also in the mesentery. There was a marked absence of the puckering and induration usually seen in cases of peritoneal cancer. The omentum hung down as a flaccid, soft, very vascular, ill-defined mass, and there was a deposit of considerable size in the pelvis, connected with the right vesicula seminalis. The primary mass of the growth was at once observed to be at the pylorus. Here the coats of the stomach were from three-quarters of an inch to an inch in thickness. This was due mostly to a thickening of the submucous tissue by a soft white growth, but partly also to hypertrophy of the muscular layer and to growth to a moderate extent in the sub-serous tissue. The pyloric orifice itself was not much narrowed; it admitted the enterotome readily. There was no definite ulceration of the mucous membrane although its surface was uneven. The coats of the stomach were not hypertrophied, the growth terminated more sharply towards the duodenum than towards the stomach. The intestine was nowhere invaded by growth. The solitary follicles in the large intestine were particularly distinct. The liver was fatty, weighing seventy-two ounces, but its tissue was nowhere invaded by growth, though there were a few nodules of secondary deposit on the capsule. The trunk of the portal vein was unobstructed. The glands about the portal fissure were many of them larger than filberts, and were full of the growth which in some of them was undergoing colloid degeneration. The glands also in other parts of the abdomen were affected. The mass of growth outside the stomach and about it was intensely vascular and of a purplish-black colour in places, so that no wonder hæmorrhage had occurred in the peritoneal cavity. The pleuræ were adherent, the lungs somewhat œdematous; the pericardium a little ecchymosed, and the kidneys healthy, weighing nine ounces. *See Insp.*, 1875, No. 126.

CASE 121.—*Carcinomatous stenosis of pylorus. Dilatation of the stomach. Secondary deposits in lymphatic glands. Atrophy of liver and heart.*—Charles T., æt. 58, was admitted under Dr. Habershon on May 5th, 1875, and died on June 24th. The patient's illness began six months previously with indigestion and tendency to vomit. Three months ago he began to feel weak. On admission he eats badly and is slightly jaundiced. The motions are black. Peristaltic movement of the stomach was visible. The heart and urine were normal. The pulse 98, temperature normal. He gradually became weaker and died. At the autopsy the body was emaciated and the heart weighed only five ounces, the aorta being of good size such as one would expect in a strong, healthy man. On opening the abdominal cavity the stomach occupied its

normal position, but more than usual was seen in the epigastrium, while it was obviously dilated and distended. On lifting it up, the duodenum was seen to make a curious curve of an S shape before turning round the head of the pancreas. At the pylorus was a puckered ring. Taking the pylorus between the fingers very little thickening could be found, but what little there was was strong and hard. The stomach was removed and filled with water and in so doing it ruptured so that its contents were not fully measured, but it was found to contain, even after the escape of some fluid, four and a half pints by measure. It ruptured by distension at the lesser curvature. Its membranes were not unhealthy. Its muscular coat was very thick and tough, giving the coats of the organ a leathery appearance and consistence. The pylorus would not allow the cone to pass beyond about half an inch in circumference. On slitting it up the mucous membrane over the pyloric ring was thick and swollen-looking and vertical section showed the subcutaneous muscle to be fibrous-looking and tough. Nothing like new growth was seen in it. No ulceration. The glands in the neighbourhood, one at the lower border and one in the portal fissure, were larger than normal and white and fleshy. Under the microscope they were found to contain cells larger than usual. A microscopic examination was also made through the pyloric ring, showing that there was little of the nature of cancer in the strictured pylorus. The muscle no doubt had a superabundance of its own proper nuclei, but it was beneath the muscle, between it and the peritoneum that the most characteristic appearances were obtained, and here spaces filled with large nuclei were found. "It seems probable therefore," says Dr. Goodhart, "that the disease began in the subperitoneal tissue." The spleen weighed three ounces and was rather firm. The lungs and other viscera were normal. The liver was very small, weighing only twenty-three ounces, very dark in colour, and the gall-bladder, which was normal, contained some orange-coloured bile. *See Insp.*, 1875, No. 249.

CASE 122. *Carcinomatous stenosis of pylorus. Dilatation of stomach and lower half of œsophagus. Extension of growth into duodenum. Secondary deposits in lymphatic glands, in liver, gall-bladder and lungs.*—Robert S., æt. 64, was admitted on May 26th, 1875, and died on August 21st. He was admitted under Dr. Habershon. No clinical account of the case is preserved. At the autopsy, the œsophagus was healthy in its upper part, but the lower half was dilated to twice the normal circumference. The stomach was considerably dilated, containing a large quantity of brown fluid, similar to that which had been vomited during life. There were several patches of injection about the lesser curvature, and considerable loss of mucous membrane, but decomposition had advanced too far to allow of any certain observation. The pylorus was thickened, and encroached upon so that the little finger could not pass. On cutting through it the thickening was found to be chiefly seated in the muscular coat. The mucous membrane appeared free. The mucous surface, however, was nodular, but without ulceration or anything to lead to the supposition that the new growth had started from an ulcer. The growth entirely encircled the pyloric end of the stomach for about two inches, thinning somewhat towards either end, and there were also two outgrowths from the main mass, one for about an inch along the lower border of the duodenum and the other about half way along the lesser curvature of the stomach. The last-named piece looked typically cancerous on section. All the glands about

the portal fissure were moderately and uniformly enlarged by secondary deposit. The liver, which weighed thirty-six ounces, had one large mass of new growth extending from the portal fissure into the right lobe. Two other small nodules were in the substance of this lobe, and one in the left. The new growth here was firm, and not softened at all in the centre, nor stained with bile, and exuded little or no fluid on scraping. The veins, duct and artery were quite free. The gall-bladder had one small nodule on its inferior surface. The spleen weighed one and a half ounces, and was free from secondary deposits. There were several secondary deposits in the lungs. The heart weighed seven ounces, and was free from growth. The kidneys were healthy. *See Insp.* 1875, No. 326.

CASE 128. *Carcinomatous ulcer on posterior wall of pylorus. Great enlargement of liver by secondary deposits. Secondary deposits in lymphatic glands. Thrombosis of femoral vein with pulmonary embolism.*—Henry P., æt. 43, was admitted under Dr. Fagge on July 22nd, 1875, and died on August 28th. He had a large, hard tumour of the liver with rounded prominences and evidently cancerous. There was no indication as to any primary source of the growth. He had no sickness and suffered but little pain. At the autopsy the body was free from jaundice but wasted and there was considerable œdema of the lower limbs. An ante-mortem thrombus was found in the left femoral vein and some of the large branches of the pulmonary artery in the left lung contained coagula, granular in structure, "and clearly, I think," says Dr. Fagge, "of embolic origin; exactly like those in the vein." The lungs were small from pressure of the diaphragm upwards. The peritoneum contained about a pint of fluid of a dark greenish colour and there were adhesions between the liver and the parietes especially over the cancerous growth. The stomach, which was small, lay flattened beneath the under surface of the liver and towards the pylorus it was adherent to that organ. "As this part evidently contained a growth, I at first," says Dr. Fagge, "supposed this had invaded the liver substance but by gentle traction the adhesions could be separated. On laying open the stomach I found that the posterior wall of the pylorus was alone diseased. The channel was twisted but when one had found the direction the forefinger could easily be passed on to the duodenum." The disease in the stomach was a cup-shaped ulcer the size of a five shilling piece. It had very thick, raised edges, and on section it was seen that these consisted of a rounded mass of growth pushing into the submucous tissue and dissecting away the mucous membrane from the muscular coat. There was no hypertrophy of the latter. No doubt the disease began in the mucous membrane, but this has long since been destroyed by ulceration. The liver weighed thirteen pounds four ounces. It was full of numerous masses of cancer, some of them rounded but the smaller ones angular to accommodate themselves to the neighbouring masses which had but little tendency to become confluent with them, being bounded by a narrow border of liver-tissue. Only one deposit was distinctly umbilicated on the surface. Most of them were degenerating in the centre, and one or two were softening down and had a yellow clear fluid in their interior. The gall-bladder was puckered and its walls thickened by œdema. It contained green bile. It was flattened beneath the under surface of the liver. Some of the glands behind the stomach were cancerous. There were no other secondary deposits. *See Insp.*, 1875, No. 331.

CASE 124.—*Carcinoma of pyloric end of stomach. Atheroma of aorta.*—Richard R., æt. 56, was admitted under Dr. Fagge on October 6th and died on November 1st, 1875. The patient had drunk freely and had never had syphilis. His health was good till about ten years ago, when he was attacked with ague. Two years ago he began to feel weak and faint, lost his colour and vomited a few minutes after food. Pain at pit of stomach, no hæmatemesis. He passed black and pitchy motions now and then. Twelve months ago he had to give up work. Vomiting has continued occasionally since then. On admission the motions were still occasionally black and pitchy. He had no vomiting while in the hospital. A systolic bruit was audible in the back and axilla. He was very anæmic. On October 31st he was seized with sudden pain in the left hypochondrium at 7 a.m., and died at 3 a.m. on the following morning. At the autopsy the body was very anæmic but not much wasted. There was slight œdema of the legs. The stomach was about the normal size. Its pyloric end was occupied by a large cancerous ulcer with flattened centre and exuberantly nodulated edges, occupying the pyloric third of the organ. The pylorus was widely open, admitting two fingers easily. The growth appeared to be confined to the mucous and submucous coats; the muscle of the coat could be seen external to it. No secondary growth either by direct extension or otherwise was found. The growth was examined microscopically and was seen to be of a cancerous nature. The liver weighed fifty-four ounces, and was free from secondary deposits and the spleen weighed four and a half ounces. The aorta was thick and dilated and the heart weighed fourteen ounces. Both lungs were œdematous and the pleuræ were universally adherent. See *Insp.*, 1875, No. 422.

CASE 125. *Carcinoma of pyloric end of stomach. Secondary deposits in peritoneum, liver, and in mediastinal and mesenteric lymphatic glands. Tubercle of lungs.*—James C., æt. 62, was admitted under Dr. Wilks on January 19th, and died on January 27th, 1876. The patient was a market-gardener, of temperate habits, who had always enjoyed good health until three month ago when he first noticed pain after food and vomiting. The latter symptom has varied somewhat, being absent at times for two or three days. No melæna. Has lost flesh and become very weak. On admission, the patient is greatly emaciated and there is some ascites. A small lump can be felt above and to the left of the umbilicus. January 25th, he vomited a quantity of black stuff of acid smell. On the 27th he vomited coffee-ground material and on the same day he died exhausted. At the autopsy the body was spare but still showed a fair degree of muscular development. There was a good deal of ascites and no anasarca. The pleuræ showed old adhesions on either side, and both lungs had in them a considerable quantity of tubercle, but apparently there was no active disease. There was a small cancerous gland in the mediastinum on the right side. The diaphragm was very extensively diseased, in fact, there was very little of the muscle left, the fibres being converted into a rigid sheet of nodulated cancer visible as such on the abdominal and thoracic aspects. The pleuræ, however, were not implicated beyond the diaphragmatic surface. The heart weighed twelve ounces, and the muscle was rather brown. The peritoneum was universally studded, but in some places more than others, by small, white, hard nodules of cancer. Thus the peritoneal surface of the diaphragm was nearly one continuous sheet of

cancer. The greater and lesser omentum were stuffed and formed thick aprons of aggregated tubercles still retaining their nodular form. The mesentery was also stuffed and the iliac regions and posterior wall of the bladder, where covered by the peritoneum, were also much affected. There were secondary deposits in the sac of an old inguinal hernia. The primary seat of the carcinoma appeared to be the stomach. The pyloric segment for two inches from the pyloric ring was contracted and nodulated externally and embedded posteriorly above and below, but not completely surrounded, on the anterior surface by a dense, hard, nodular mass of cancer. On opening the viscus there did not appear to be any great amount of obstruction. The enterotome passed quite easily. Corresponding to the external disease were large bosses of new growth extending into the cavity underneath the mucous membrane. One mass, the size of a walnut, had sloughed away, leaving a deep ulcer in its substance, the floor of which contained black sloughy tissue. Other bosses were smaller but projecting by a considerable elevation into the cavity of the stomach. All seemed to grow in the submucous tissue and to have the mucous membrane unaltered and stretched over them. The muscular coat was a good deal thickened towards the pylorus and changed in colour by the general infiltration of cancerous elements, some parts being quite white and yielding a cream-like juice, and others of a greyish and more colloid aspect. The rest of the stomach was healthy, and "I can find no evidence," says Dr. Goodhart, "of any ulceration of old date which might have determined the cancerous growth." The liver weighed sixty-six ounces, and contained two large yellowish firm masses of new growth. The gall-bladder was healthy, the mesenteric glands contained secondary deposits and the spleen, which was soft, was free from cancer. The kidneys were quite healthy except that one contained a good sized cyst. The new growth in the stomach was examined and showed a very delicate filamentous connective tissue, forming alveoli, which contained numbers of rather small cells so altered by degeneration that they did not present very characteristic appearances. The patient was also found to suffer from osteo-arthritis and from gout, in addition to phthisis. *See Insp.*, 1876, No. 45.

CASE 126. *Contraction of the stomach from carcinomatous infiltration of its middle zone. Secondary deposits in peritoneum, liver and ovaries. Ovariectomy. Peritonitis.*—Mary E., æt. 35, was admitted under Dr. Hicks and Mr. Bryant, and died on the day after the performance of a double ovariectomy. At the autopsy acute peritonitis was found to an extent which seemed remarkable, considering the short time which had elapsed since the operation. There were secondary deposits of cancer on the peritoneum, the omentum was nodulated and its fat puckered up into hard masses. Many of the mesenteric glands were full of new growth. There were a few about the liver, one of which was growing into its substance. The stomach was contracted so that it would not have held more than half a pint. Its wall was a third of an inch thick and stiffened by growth of white, fibrous-looking cancer in its submucous tissue inside the hypertrophied muscular coat. The disease did not affect the cardiac or the pyloric orifice, but the greater part of the middle of the stomach in its whole circumference. The thoracic viscera were healthy, except that the lungs were emphysematous. Dr. Fagge suggests that the growth of the ovaries may have been a carcinoma. *See Insp.*, 1876, No. 163a.

CASE 127.—*Carcinoma of the pyloric end of stomach invading the pancreas. Secondary deposit in the liver. Necrosis of the sternum.*—Susannah E., æt. 59, was admitted under Dr. Moxon on January 18th, 1876, and died on May 4th. She was a married woman with ten children. She had lost flesh rapidly during the last six months. A month before admission she noticed a prominence on the front of the chest on the left side of the sternum, gradually extending to the right side. She had a fluctuating swelling over the mid sternum on admission, which was opened, and subsequently a good deal of necrosed bone removed. A hard, nodular mass was also found an inch and a half to the left of the umbilicus. She was not noticed to have had any gastric symptoms, and she sank with low temperature and gradual exhaustion, it was thought from the suppuration behind the sternum. At the autopsy there was found over the mid-sternum, extending from the level of the upper border of the third rib down to the lower border of the fifth rib, a large gaping wound with a piece of the sternum projecting through it. There were adhesions to the pleura and pericardium. There seems to have been no evidence of malignant deposit in the bone. There was a little recent pleurisy, and the bronchial tubes, which were dilated, contained an excess of secretion. The stomach was of normal size, and at the pyloric end was a large ragged ulcer with a bossy surface and overhanging edges extending round the entire pyloric ring. Its floor was formed by the pancreas, and on inspection the latter organ was found to be distinctly infiltrated by a white, milky, new growth. There is no indication of the disease having started in an old ulcer. The pyloric ring was widely patulous, and there was no sign of any hæmorrhage. The intestines were normal. The liver weighed forty ounces, and in the quadrate lobe was a lobulated mass of new growth occupying most of the lobe and bulging on either aspect of the liver, but not yet pressing to any extent on the gall-bladder or implicating the portal fissure, which was free. The surface was not adherent to the stomach. A section showed a yellow aspect, the whole mass undergoing extensive fatty changes. Under the microscope both the stomach tumour and the hepatic had all the appearance of a cancer as judged by the epithelial type of cell and by its great variety in size and form. The heart weighed nine ounces and the kidneys were healthy. See *Insp.*, 1876, No. 177.

CASE 128. *Carcinoma of pylorus and lesser curvature of the stomach, producing freely movable abdominal tumour. Secondary deposit in the liver.*—Emma H., æt. 58, was admitted under Dr. Moxon, on May 10th, 1876, and died on May 15th. Three months before admission the patient noticed a feeling of weight, and increasing size in the lower part of the abdomen. She began to vomit after food, and the bowels were much constipated. The weight of the body fell from ten stone to seven stone. On admission, a tumour was felt to the right of the median line above the umbilicus, freely movable. She had not attempted to eat anything for a month. On the 11th, half an hour after taking some tea and bread and butter she vomited. She died on the 15th. At the autopsy, the body was much emaciated, the lungs were cedematous, and a solid patch of grey hepatization was found in the right lung. The stomach was not at all dilated, in fact it was of normal size. Along the lesser curvature there were some small grains of cancer beneath the serous membrane. The pylorus formed a mass as large as a Tangerine orange. The

enterotome passed readily through it. It was then found that there was a cancerous ulcer with sinuous fungating edges about an inch and a-half in length, which nearly met round the circumference of the pyloric portion of the stomach. The muscular coat was hypertrophied. The growth was soft, and gave a milky juice. Outside the stomach there was some extension of the growth in the connective tissue near the pancreas. The bile-duct was not obstructed. The liver, which weighed fifty-six ounces, was healthy, except for one secondary nodule. There were no other secondary deposits, and the kidneys were healthy. *See Insp.*, 1876, No. 192.

CASE 129. *Carcinoma of pyloric half of stomach causing a freely movable abdominal tumour. Interstitial nephritis.*—Joseph P., æt. 67, was admitted under Dr. Taylor on April 26th, 1876, and died on June 12th. Seven or eight weeks before admission the patient began to feel heavy pain in the stomach after eating or drinking anything. Two weeks later a lump was felt in the lower part of the abdomen and to the right side. The swelling was never tender but gradually increased in size. On admission a swelling could be seen at the junction of the right iliac and right inguinal regions. It moved during respiration and was also freely movable under the hand. It was considered to be scirrhus pylorus. May 16th, sick for first time since his admission. 23rd, vomited half digested food. June 3rd, very sick. He died quietly on the 12th, and at the autopsy the body was found to be moderately wasted. The lungs were emphysematous and the heart weighed thirteen ounces, the right ventricle being especially hypertrophied and dilated. The kidneys were affected with interstitial nephritis. When the chest and abdomen were opened the tumour was seen to lie not in the position in which it had been observed during the greater part of the man's stay in the hospital, but much higher and close to the under surface of the liver. It could readily be stretched down to about the level of the umbilicus if not lower. The house-physician stated that towards the end it had been noticed that the tumour was no longer so low in the abdomen as before. It was a mass nearly as large as the closed fist. The stomach proved to be greatly elongated; its walls were thin up to the margins of the growth. This formed a wide, open chamber at the pyloric end of the organ. It narrowed at the orifice but even this would readily admit one's forefinger. At the pylorus the disease abruptly ceased, not invading the duodenum at all. The stomach is preserved and forms Preparation 706, thus described:—"The pyloric half of a stomach showing a flat mass of growth occupying the entire circumference of the organ and extending from the pylorus four inches along the lesser, and five inches along the greater curvature. The surface of this mass is irregular and in parts ulcerated. Its edge towards the fundus is well defined. A section through the affected part shows all the coats of the organ to be destroyed by infiltration with a growth which histologically has the characters of a spheroidal-celled carcinoma with scanty stroma. There are numerous adhesions upon the serous coat." Dr. Fagge adds that there were no secondary deposits unless perchance in one or two of the neighbouring glands which, however, were not larger than beans. The liver weighed only forty-two ounces and showed marked atrophy. The spleen weighed six and a half ounces and was healthy. *See Insp.*, 1876, No. 239.

CASE 130. *Carcinoma of the pylorus, invading the pancreas. Secondary deposits in mesenteric, mediastinal and cervical glands, and in the liver.*—George E., *æt.* 47, was admitted under Dr. Pye-Smith on April 26th, 1876, and died on June 28th. About seven weeks before admission the patient began to experience pricking pain at the pit of the stomach and vomiting of a sour fluid, occasionally streaked with blood. The vomiting came on from a few minutes to two hours after food. The motions were black. Five weeks ago he noticed a lump. On admission an irregular, hard mass was felt midway between the ensiform cartilage and the umbilicus. June 18th, temperature 103.5°; 23rd, the patient is sick every morning. At the autopsy the body was found to be much emaciated. Some of the glands at the root of the neck at the right side were enlarged and cancerous, and the mediastinal glands were also cancerous, one being as big as a pigeon's egg. The pylorus formed a rounded tumour, just projecting under the edge of the liver. The stomach was moderately dilated and a little hypertrophied towards its pyloric end. The disease at the pylorus formed a large round ulcer, with thickened lip-like margins chiefly affecting its posterior wall. The growth grasped the finger tightly; but the latter could with a little pressure be passed through into the duodenum. The cancer did not extend along the lesser curvature much, but it had invaded the head of the pancreas. There were also numerous cancerous glands scattered about, some of them in the portal fissure, and slightly pressing upon the structures in that situation. The pancreatic duct was dilated considerably, and filled with a milky fluid. The liver contained several scattered nodules of cancer, the largest, as big as a Tangerine orange, being in the left lobe. The gall-bladder contained dark bile. The spleen weighed three and a-half ounces, and the kidneys were healthy. See *Insp.* 1876, No. 266.

CASE 131. *Carcinoma of the greater curvature of the stomach, probably secondary to simple ulcer. Secondary deposits in peritoneum and liver. Ascites. Former gall-stones.*—Edward W., *æt.* 43, was admitted under Dr. Wilks on August 2nd, 1876, and died on August 8th. The patient had jaundice three years ago. One month ago his abdomen began to swell and he felt pain in the right shoulder and side. He suffered much from constipation. On admission, he was very wasted and the abdomen was very tense and fluctuating. Great dyspnoea. The abdomen was tapped the night before the patient's death, and after the operation an indurated omentum was distinctly recognised. He seemed to be quite comfortable afterwards, but at 4.45 a.m. he suddenly died. At the autopsy the body was moderately wasted and the peritoneal cavity was found still to contain some fluid. The liver projected a little below the ribs and was rounded with thickening and irregular cancerous nodulation of the peritoneal coat. Below it was a puckered mass including the stomach, duodenum, omentum, etc. After removal, the starting part of the disease was seen to be a cancerous growth of the coats of the stomach at the greater curvature a little way from the pylorus. There was no ulceration but a depressed flat surface (healed ulcer ?) the size of a five-shilling piece, round which the mucous membrane was thrown into irregular rugæ. The disease extended through to the serous coat and there was much irregular cancerous growth in the peritoneum. The omentum formed a hard granulated mass. The mesentery was indurated, shortened, and flecked all over with

white spots and patches of growth. The glands and vessels in the substance of the mesentery were all free. At one point, however, the small intestine was considerably narrowed, but without implication of its coats in the disease, apparently only by shrinking of the serous covering of the mesentery. The liver contained one or two small cancerous nodules all of which seemed to be developed along portal canals. The ducts throughout the liver were much dilated, at least as large as the corresponding portal veins. The hepatic duct and ductus communis choledochus were also much dilated, and on passing a probe down the latter into the duodenum it was found that there was a fistulous opening into the latter above the proper orifice. This would have allowed a bean to pass through it. It had smooth margins. "One could not doubt," says Dr. Fagge, "that it had been formed by the passage of a gall-stone." The gall-bladder was much contracted, it contained no gall stones. The rest of the viscera were healthy. *See Insp.*, 1876, No. 303.

CASE 132. *Carcinomatous stenosis of pylorus with extreme dilatation of stomach. Secondary deposits in liver and lymphatic glands.*—George B., æt. 36, was admitted under Dr. Pye-Smith on August 15th, 1876, and died on August 23rd. He was a married man with three children. He two years ago had jaundice, from which he recovered in a month. Five months before admission he began to be sick, and the stomach began to be distended. On admission, the patient is emaciated and has a much dilated stomach, extending downwards as far as the pubes. On the right side, one inch below the ribs, and an inch and a-quarter from the umbilicus, there can be felt a hard mass about three inches long and one and a-half inches wide, rough to the touch. The lungs are healthy, the urine normal. August 22nd: has gradually got worse; vomits up an immense quantity of coffee-ground fluid containing sarcinæ. At the autopsy the body was much emaciated, and the stomach occupied nearly the whole of the abdominal cavity, and scarcely anything else could be seen, the intestines being entirely hidden by it. There was a large, circular, hard, whitish mass situated at the pylorus, not encroaching at all upon the duodenum, but extending a little way along the lesser curvature. There was a separate mass about the size of a walnut midway along the lesser curvature, which was probably an enlarged gland. The main lump was about an inch in breadth and half an inch in thickness. The walls of the stomach appeared of normal thickness. The cesophageal extremity of the stomach was quite free from any growth. The liver weighed thirty-one ounces, and contained two small secondary deposits, each about as big as a large pea. The gall-bladder contained bile; the spleen weighed two ounces, and was tough. The heart weighed seven ounces, and the lungs and kidneys were healthy. *See Insp.*, 1876, No. 350.

CASE 133. *Carcinoma of posterior wall of the stomach with secondary nodule at cardiac orifice. Secondary deposits in mesenteric, mediastinal, and cervical glands and in the liver. Gall-stones.*—John D., æt. 56, was admitted under Dr. Wilks on November 1st, 1876, and died on December 8th. He was a labourer who a few months before admission began to have pain in the legs and abdomen, and was frequently sick. On admission he was much emaciated and had a considerable degree of ascites. The liver was small; there was no jaundice. Some dysphagia for which a bougie was passed which seemed to

meet with slight obstruction near the cricoid. No vomiting whatever. He never had any vomiting while in the hospital. He gradually sank out exhausted. The ascites diminished at the last. At the autopsy the body was much emaciated and the heart weighed seven ounces, the muscle being very brown. At the root of the neck the glands were enlarged into the size of Tangerine oranges. They were white on section and gave out a thick juice. They had evidently become infected from below upwards as the chain was continuous. In the posterior mediastinum there was a continuous chain of large fleshy glands, not forming one large tuber, but all the size of chestnuts or so. Those at the upper part pressed out of position the main vagus trunk on each side as it ran on to the œsophagus but they had exerted no visible pressure on it anywhere. The lungs were small and contained one or two small secondary deposits. The peritoneum generally was healthy but the omentum, which was small and very delicate, was studded throughout by shot-like nodules of cancer extending from around the stomach. The stomach was very small, not so deep from above downwards as the palm of the hand, but rather more elongated than deep. The lesser curvature and the gastric wall were embraced in a large hard nodulated mass of cancer. On opening the organ this was found to be connected with and to start in a large, hard, bare, cancerous ulcer on the posterior wall of the stomach, taking up the greater part of this surface from cardia to pylorus. Near it but not quite continuous with its left end was a small raised growth at the cardiac end of the œsophagus. It was secondary in point of time to the main disease of the stomach. It had produced no thickening of the walls and could have caused, as yet, no obstruction. The stomach walls were much thickened throughout but a good deal of this was due to close contraction and induration rather than to infiltration of the coats by new growth. The muscular coat looked very thick, the pylorus was free. The glands behind the stomach formed a large mass, half the size of one's fist, of pale soft growth. They did not surround the portal fissure, and the portal vein was quite unobstructed. The portal duct and hepatic artery were quite free. The glands extended thence, enlarged by secondary deposit, to the mediastinum. The liver weighed thirty-four ounces and was atrophied. It contained several very small, millet-seed sized nodules in its substance and some beneath the peritoneum. The gall-bladder and the ducts were distended. The common duct contained four or five small, faceted gall-stones. There was no ulceration and no complete obstruction. The pancreas was healthy itself but surrounded by a large mass of infiltrated glands. The spleen weighed four ounces and was free from infarction. The splenic artery and vein were closely surrounded to their terminations in the organ by a hard dense mass of glands and they must have undergone considerable pressure. The suprarenal capsules and kidneys were healthy. See *Insp.*, 1876, No. 486.

CASE 134. *Carcinomatous stenosis of the pylorus*.—Annie B., æt. 49, was admitted under Dr. Wilks on January 3rd, 1877, and died on January 11th. She was a widow with nine children, all dead. She had always enjoyed good health up to the time of her present illness, which began five week ago with a feeling of tightness over the abdomen followed by a bearing-down pain. She took purgatives and kept the bowels open until five days before admission. The motions then became very small and since that time she has been much

constipated. She has taken no solid food for five weeks. Her chief symptom was said to be constant vomiting with retraction of the abdomen. Before her death she became drowsy and the vomit had a faecal odour. At the autopsy the body was by no means remarkably emaciated and the heart weighed nine ounces. There were some superficial ulcers at the lower end of the œsophagus. The stomach was moderately distended and contained a brown, bile-coloured, treacly-smelling fluid, with grape-pips and fig-seeds in it. The mucous membrane was intensely congested so as to be a deep port wine colour, which Dr. Goodhart says he at first thought must be due to post-mortem staining, but the body being still warm, and there being no evidence of decomposition, he was inclined to attribute it to gastritis. The pylorus was closely contracted and would only admit a small catheter. On slitting it up a small vertical ulcer was found in the pyloric cavity sharply defined with very deep edges, pink, and with a hard cancerous mass in its floor. The latter had not yet extended further than the immediate floor of the ulcer. The structures of the portal fissure were normal, and the intestines were much contracted throughout their whole length. The liver weighed fifty ounces, and was healthy. A microscopical examination of the growth showed that the infiltrating edge in the muscle was occupied by tubes or spaces lined with a single layer of cylindrical epithelium having a columnar arrangement. "These had located themselves," says Dr. Goodhart, "in between the bundles in all directions." There were no secondary deposits. See *Insp.*, 1877, No. 19.

CASE 135. *Carcinoma of pylorus. Softening secondary deposits in glands of groin, mediastinum, and in kidneys and liver. Healed phthisis.*—William R., æt. 50, was admitted under Dr. Moxon on January 24th, 1877, and died on February 25th. The patient had always enjoyed good health till thirteen months ago, when he felt pain in the stomach of a burning character, made worse by food, and relieved by vomiting. These symptoms remained the same for five or six months. At this time he noticed a swelling in his right groin, which has suppurated slightly up to the present time. The vomiting has ceased, the pain continues. On admission he was rather thin and anæmic, complaining of pain in the epigastric region, in which situation some hardness could be felt. He had also a cough. The lungs appeared to be normal. January 25th, he was expectorating blood of a bright red colour. He died gradually from exhaustion, and at the autopsy it was found that the suppuration in the left groin was caused by the breaking down of cancerous glands. The cervical glands were normal, the lungs œdematous, and there was some sign of old phthisis at both apices. What, however, was unusual was that at the root of each lung was a solid mass about an inch and a-half in diameter, which was very soft on section, and exuded a thick pultaceous substance. It looked like a cheesy abscess rather than anything else, but the walls were very ill-defined. The mass on the left side had infiltrated the mediastinal tissues, and puckered up the aorta to it, but without distorting it importantly. The character of this mass was, in Dr. Goodhart's opinion, cancerous, and he draws attention to the proneness of all secondary deposits in this case to undergo caseous changes. That in the lungs could not, he said, be distinguished from a caseous pneumonia softening into an abscess. The mediastinal glands were all quite soft in the centre, and yellow, like pus; so again were the glands of the portal fissure and the glands of the groin. "It

seems possible," he says, "that this may be explained by the fact that caseous relics were found in the lungs, so that the patient was inclined to cheesy changes, and on this hypothesis the case must be considered a mixture of struma or scrofula and cancer." The kidneys also contained small secondary deposits, which projected a little, were white and yellowish, and softening on section. The œsophagus presented a peculiar condition of post-mortem digestion in the lower two thirds, the walls of which were somewhat thickened and dilated. The stomach was dilated, the lesser curvature dimpled and irregular-looking, from some old inflammation, but no ulceration was present. The pylorus and the pyloric inch were considerably thickened by a white sub-mucous growth, and the pyloric orifice was by this means much narrowed, so that the blade of the enterotome would not pass through it. The growth was nearly all sub-mucous, and microscopically was a cancer. The cells were thickly crowded, being epithelial in character. The muscular coat was much thickened, one or two glands of the portal fissure were large and fleshy, and caseous at the centre. The liver was healthy, except that it contained two small nodules of cancer, one on the upper surface of the left lobe; and one on the under surface, just close to the portal fissure. The spleen weighed four and a-half ounces, and was very soft. See *Insp.*, 1877, No. 73, and *Preparation of Œsophagus*, No. 533.

CASE 136. *Carcinoma of the pylorus. Secondary deposits in liver, peritoneum, glands and vesiculæ seminales. Thrombosis of femoral and iliac veins.*—George H., æt. 54, was admitted under Dr. Pavy on January 24th, 1877, and died on February 28th. The patient was a book-binder, and began to feel ill about five weeks before admission. At that time, after taking food, he had a dull aching pain at the umbilicus which used to last a considerable period. Soon afterwards he had pain in his legs, which became swollen, the right one first, in the calf, the left all the way up. A month ago his doctor noticed a lump to the right of the umbilicus in the epigastrium. For the last month he has vomited everything he took. The vomit is of a yellow colour and very bitter. On admission he was much emaciated and the glands in both groins were enlarged. His appetite was bad. The left leg was much swollen but not painful. No cause for this could be found. The femoral vein appeared normal. The mass near the umbilicus was e'longated in shape and appeared to be fixed to the abdominal muscle. The patient sank gradually, and before death he brought up six ounces of dark-coloured blood. At the autopsy he was much emaciated and there was considerable œdema of the right leg. The inferior vena cava was plugged with thrombus a little above its origin. The iliac and femoral veins were also plugged with adherent ante-mortem clots, which seemed to be oldest in and about the folds of the groin. The stomach was found closely adherent to the under surface of the liver. It was small, containing an ounce or two of reddish-brown, viscid fluid. When laid open it was found that at the pylorus there was a large cancerous ulcer, with fungating borders and a sloughy base, the last consisting in great measure of inflamed and gangrenous hepatic tissue. The left lobe of the liver in front formed the greater part of the floor of this ulcer, a thickish zone separating the healthy hepatic substance from the coats of the stomach. The liver also contained numerous malignant nodules, the largest of which appeared to have penetrated its tissue from the serous

surface. The peritoneum contained a pint or so of yellow-brown fluid, with nodules of hard carcinoma, flat, and often umbilicated. These were found in many places, especially about the diaphragm and the flanks. There was also a good deal in the omentum. From near the pylorus a fibrous band half an inch long went to the abdominal wall above the umbilicus and ended in a roundish nodule of cancer the size of a marble, which was embedded in the rectus muscle. It was also found that in the pelvis was a deposit of carcinoma constituting a fan-shaped mass, perhaps two inches across, clearly occupying the seat of the vesiculæ seminales, one or both; and indeed it contained the dilated cavity of one of the vesiculæ seminales at least. The right testis was considerably enlarged and there was an excess of fluid in the tunica vaginalis. The epididymis was the seat of a small hard cancerous growth, the secreting substance of the organ being healthy, except for a compression of its tissue. The tunica vaginalis also presented numerous flat cancerous nodules exactly like those on the peritoneum, and this was due to a continuous cancerous mass extending upwards along the cord, "so that I was rather inclined," says Dr. Fagge, "to the view that the vaginal process of peritoneum had been open until obliterated by cancerous growth, and that the affection of the epididymis had thus arisen by extension from the peritoneum." Many of the mesenteric and lumbar glands contained cancerous deposit, as also the inguinal glands. The gall-bladder was distended; there was no obstruction to the flow of bile. The spleen weighed three ounces, and there was a small infarct in its anterior edge, doubtless due to obstruction of part of the splenic artery, "in which indeed I think I made out the presence of a small thrombus." The heart weighed eight ounces and was in a condition of brown atrophy. The coronary arteries were highly atheromatous and the lungs somewhat emphysematous. See *Insp.*, 1877, No. 76.

CASE 137. *Carcinoma of pylorus. Secondary deposits in omentum, liver, and lymphatic glands.*—William B., æt. 67, was admitted under Mr. Lucas on May 4th, 1877, and died on May 30th. About a year before his last admission the patient had been in the hospital with a warty growth which was removed from the right side of his nose. About ten weeks before admission the growth returned and he was taken in that it might be again removed. On May 8th the growth was removed and the wound went on well, but on May 18th sickness supervened. This continued with headache and it was followed by an attack of erysipelas of no great severity. He continued with vomiting and diarrhœa up to the time of his death a little more than three weeks after admission. At the autopsy a round secondary growth was found in the lesser omentum and there were a few secondary growths in the liver, which weighed forty-two ounces. The cardiac orifice of the stomach was normal but the pylorus was occupied by a malignant growth not quite encircling the ring, the aperture, however, being much narrowed by it. The growth was hard and white on section and presented an ulcerated surface. The heart weighed eleven ounces, and the spleen, which weighed three ounces, was hard. The mesenteric glands were soft and white on section and probably contained secondary deposits. The kidneys were healthy. There was an old inguinal hernia. See *Insp.*, 1877, No. 195.

CASE 138. *Chronic ulcer and carcinoma of pylorus. Perforative peritonitis. Secondary deposits in gastric lymphatic glands.*—George C., æt. 48,

was admitted under Dr. Taylor on June 5th, 1877 and died on June 10th. Three months before admission the patient noticed that his abdomen became hard, and he passed a quantity of wind, which was followed by sickness. Since then he has been sick every day, with urgent pain in the epigastric region. Vomiting relieved the pain. The bowels have been constipated. Pain of a gripping character after taking food, which lasts till he is sick. On the day of admission he was following his occupation of driving a tram-car, when he was suddenly seized with pain in the abdomen so violent as to cause him to drop down. He afterwards vomited, but without relief. On admission he presented symptoms of peritonitis, having a temperature of 100.5° and a pulse of 128, small in volume. The pain is localised at a small spot to the left of the umbilicus. On June 10th he became violent, and the abdomen was acutely tender. He died comatose, and at the autopsy the body was of spare frame and there was hypertrophy of the right side of the heart, the right ventricle being thick, the tricuspid flaps thickened and the foramen ovale patent. The pulmonary valves were also a little thick. The left side was normal and the heart weighed ten ounces. A quantity of bile-coloured fluid and lymph was found in the peritoneal cavity and immediately below and at the inner side of the gall-bladder notch was some evident white cancerous growth, with a perforation in the walls of the stomach. On examining the parts it was found that immediately inside the pylorus there was a large chronic ulcer extending three-quarters round the circumference but not extending to the quarter which included the lower border. The thinnest part of the ulcer had perforated through the anterior wall of the stomach, the edges being thinned out and gelatinous-looking. In the edges and floor of the ulcer was a white, infiltrating growth, and this further extended into the portal fissure by the enlargement of the glands. There were no other secondary deposits. Under the microscope the ulcer showed a fibrous matting of cicatricial appearance, but with an unusually large number of closely-packed nuclei in it, and then, scattered about, were spaces containing a lining of columnar epithelium in places, and in places a roundish, glandular looking epithelium. It appeared to be a mucous membrane growth, infiltrating the deeper parts. The liver weighed fifty-six ounces, the spleen three ounces, and the kidneys ten ounces, all being healthy. See *Insp.*, 1877, No. 210.

CASE 139. *Carcinoma of lesser curvature of the stomach. Independent simple ulcer. Secondary deposits in peritoneum. Cerebral abscess.*—James J., æt. 59, was admitted under Dr. Habershon on July 19th, 1877, and died on August 4th. The patient enjoyed good health till five years ago when he brought up coffee-ground matter and on one occasion he brought up congealed blood. He has had vomiting of a similar material twice and sometimes three times a day ever since. He has lately brought up a small quantity of blood. On admission there was some swelling in the left hypochondrium and he vomited every day a certain quantity of coffee-ground material. He was delirious and then became stupid and drowsy and passed everything under him. He lapsed into semi-consciousness and lay most of the day asleep. He died easily. At the autopsy an abscess cavity as large as a good-sized duck's egg was found in the left temporo-sphenoidal and occipital lobes, the membranes of the brain being a good deal thickened. No mention is made as to the condition of the petrous bones of the ear. The lungs were emphysematous and the heart weighed eleven ounces, and on one of the segments

of the aortic valve, which was somewhat thickened, was a vegetation about the size of a large pea. The stomach and œsophagus were filled with dark, coffee-ground-like material and on the outer surface of the stomach clustered over the smaller curvature were numerous hard, yellow, cancerous bodies of the size of a millet-seed to a pea. On the inside of the stomach there was a hard mass about three inches by two inches lying between the œsophageal and pyloric orifices. The mass was fairly level and on cutting into it it was found to be half an inch thick and yellow. There were some hard nodules round its edges. There was also a shallow ulcer without hard edges and about half an inch in diameter. The liver weighed fifty-four ounces, the spleen was normal and the kidneys, which weighed twelve ounces, were also normal. See *Insp.*, 1877, No. 275.

CASE 140. *Carcinoma of pylorus. Great enlargement of liver by secondary growth. Deposits in lymphatic glands. Thrombosis of femorals. Pulmonary embolism.*—John H., æt. 42, was admitted under Dr. Moxon on August 1st, 1877, and died August 14th. The patient had suffered from sickness and pain after food for about seven months. He was admitted for an enormous painless enlargement of the liver which was hard. He was much wasted and had a careworn expression. He vomited occasionally a brownish liquid. On the day of his death he was attacked with dyspnœa and became collapsed. "When," says Dr. Fagge, "I visited the ward, the coldness of exhaustion and the pulselessness were the most marked symptoms. I thought of hæmorrhage into the peritoneal cavity from rupture of carcinoma of the liver." At the autopsy the body was much wasted and both main divisions of the pulmonary artery were plugged entirely by loose masses of clot, clearly embolic. The right one showed most distinct markings of valve, the left one was folded twice on itself. On further investigation of the femoral veins, the right one was plugged by a massive thrombus exactly like the emboli in the pulmonary artery in character and obviously of the same date. The left one was empty and "was doubtless," says Dr. Fagge, "the cause of the emboli." The stomach was dilated and its pylorus was adherent to the under surface of the liver by bands of adhesions. It was indurated and narrowed so as to only just admit two fingers, and it presented a puckered cancerous ulcer. The liver weighed one hundred and eight ounces, and was full of cancerous deposit. Much of the cancerous deposit had a deep purple colour as if consisting of little, but dilated, blood-vessels. There was but little caseation, and the growth had a white appearance with a good deal of creamy juice, yet it was decidedly firm, resisting a considerable degree of pressure. Many of the glands in the portal fissure were cancerous. The spleen and kidneys were healthy. See *Insp.*, 1877, No. 282.

CASE 141. *Carcinoma of pylorus, possibly following upon simple ulcer. Secondary deposits in liver, and in abdominal and mediastinal lymphatic glands. Thrombosis of internal iliac vein. Pulmonary embolism. Phthisis. Acute colitis.*—Edward H., æt. 36, was admitted under Dr. Pavy, on July 8th, 1877, and died on September 6th. No clinical account of the case is preserved. At the autopsy, the body was considerably emaciated, and the lungs presented evidence of extensive phthisis, with confluent broncho-pneumonia. There was a small ante-mortem embolus in a branch of the left pulmonary

artery to the lower lobe, and the left internal iliac vein was plugged by recent ante-mortem clot. The stomach itself was rather contracted, and its pyloric region surrounded and puckered by a hard mass of cancer, so that on opening the cavity and attempting to pass the finger, this was found to be impossible. The obstruction was, however, more due to the puckering up than to absolute closure, for the scissors passed easily after opening the duodenum and stomach, on either side, quite up to the obstruction. The growth was a hard, white cancer, with big epithelial-like cells in it. At the pylorus was an excavated ulcer of milky white appearance, and indurated edges. "I could not," says Dr. Goodhart, "say whether the ulcer was the consequence of the cancer or its precedent." The stomach contained a good deal of half digested food. The small intestine, with the cæcum and appendix was quite healthy, but below this the colon and rectum were in a condition of extreme inflammation. Along the colon to the sigmoid flexure the longitudinal bands of the bowel were marked out on the mucous surface by lines of ulceration of dark colour and of granular surface, and jutting off from these in many places were linear ulcers of similar appearance running round the bowel. The liver contained many masses of hard, white cancer, having the same epitheloid character as the growth. The gall-bladder was enlarged, the lumbar glands were hard and cancerous, the spleen was healthy, the mediastinal glands were enlarged, hard and cancerous; the kidneys were healthy. See *Insp.*, 1877, No. 311.

CASE 142. *Carcinoma of pylorus. Dilated stomach. Secondary deposits in lymphatic glands. Brown atrophy of heart.*—Eliza A., æt. 37, was admitted under Dr. Habershon on October 1st, 1877, and died on October 17th. Two years ago the patient was attacked with vomiting, at first once a day, and afterwards oftener. Occasionally the vomit contains blood and is sometimes of a coffee-ground character. There is pain in the region of the stomach and a lump is felt to the right of the epigastrium. The outline of the stomach and its movements were plainly seen. For some hours before her death the patient became semi-unconscious with frequent vomiting. At the autopsy the body was much emaciated and the heart weighed four ounces—"in a marked state," says Dr. Fagge, "of brown atrophy." The lungs were very emphysematous. The œsophagus was full of brown liquid from the stomach, and the stomach itself was enlarged and extended downwards into the left iliac fossa. The muscular coat was much thickened, appearing as a network of trabeculae, especially where the gastric mucous membrane had been partially dissolved off. The pylorus formed a nodulated tumour close beneath the under surface of the liver, being fixed upwards by extension of the cancer in the lesser omentum round the bile-duct. But the pylorus itself was not adherent to the liver. The finger could be passed through it with a little difficulty. When laid open it was found that there was scarcely any ulceration. The growth lay mainly in the submucous tissue. The muscular ring of the pylorus was greatly thickened. The glands about the pancreas were infiltrated with the growth, which also affected the other tissues and extended down into the mesentery, uniting at one spot the attached edge of the small intestine. In places it looked a little gelatinous, as if it were beginning to undergo colloid change. The liver was much wasted but otherwise healthy. The spleen, which weighed one ounce, was healthy, and the kidneys were also healthy. See *Insp.*, 1877, No. 354.

CASE 143. *Colloid carcinoma of pylorus, lesser curvature and cardiac orifice. Secondary deposits in peritoneum and lymphatic glands. Ascites.*—James H., æt. 45, was admitted under Dr. Pavy on July 15th, 1877, and died on October 17th. The patient had been a hard drinker and ten weeks ago had a sore sensation about the stomach which he attributed to the effects of bad cheese. Three days after he was unable to keep his food down. On admission he was emaciated and had most obstinate vomiting, as many as forty times in the day. By very careful feeding on liquid diet this ceased to some extent and then the stomach pump was used to wash out the cavity. September 18th, peristaltic movements of the stomach visible. Stomach much dilated at times. He became more emaciated daily and died out exhausted. At the autopsy the heart was found to weigh seven ounces and the muscle, which was brown, had shrunk away from the arteries, which consequently projected unduly and were markedly tortuous but free from disease. The peritoneum contained a good deal of slightly turbid, ascitic fluid. The surface of the liver was rough from lymph on its capsule. The œsophagus at its cardiac end showed some infiltration of one of its longitudinal folds by invasion of the gastric growth, which had spread along the lesser curvature of the stomach. The stomach itself was not now dilated, but its pyloric third was much thickened and contracted by a large infiltration of the mucous and submucous coats with a colloid growth, which occupied about two-thirds of the whole thickness of the wall. The disease ceased abruptly at the pylorus and spread thence towards the cardia, mostly along the lesser curvature, hardly any of the mucous membrane at this part being free. On the posterior surface and greater curvature, however, the cardiac half was free from the general thickening which occupied the other part, but the mucous and submucous tissue was extensively affected by circular, raised, flat plaques of cancer some of which had joined and so appropriated a large tract, but many were still separate. These were mucous membrane growths rather than submucous. The mucous membrane not affected thus was a little thick but otherwise healthy. The disease had spread to the part outside the stomach to the extent of matting up and thickening the cellular tissue in the portal fissure but it did not narrow, or in any way obstruct any of the vessels or ducts there. It extended into the mesocolon near the pylorus puckering up the colon at this spot and sometime later would have produced constriction. Round the head of the pancreas was also some tough new growth. One or two small glands were affected near, but except these parts all these tissues were quite healthy. The liver was very small, the spleen was firm, weighing three ounces, the kidneys were healthy. Microscopic examination of the growth showed that it was a cylindrical carcinoma with scanty stroma, and from the naked-eye appearance much of it had undergone colloid change. See *Insp.*, 1877, No. 357.

CASE 144. *Carcinoma of pylorus and lesser curvature of stomach. Perforative peritonitis. Secondary deposits in lung.*—Margaret S., æt. 55, was admitted under Dr. Wilks on October 15th, 1877, and died on December 30th. For the last thirteen or fourteen years the patient has always suffered from pain in the pit of the stomach and between the shoulders immediately after food. She has never been accustomed to drink beer or spirits. For the last eighteen months she has suffered from severe pain and sickness coming on

about three hours after a meal. During the past two months the symptoms have been much more severe. Once or twice she says she has vomited dark matter and also passed pitchy stools. She often vomited when the stomach was empty. For some years she has lost flesh and on admission she was thin, with a pale sallow look, complaining of great pain in the stomach and vomiting. The liver could just be felt. The stomach was distended, the greater curvature being seen on a level with the umbilicus. No tumour could be felt and there were no sarcinæ in the vomit. She gradually sank, and at the autopsy there was general peritonitis, the abdomen containing a large quantity of greenish material lying behind the stomach. On raising up this organ, a small circular opening with hardened edges was found close to the under surface of the liver. The tissues round the pancreas were matted and hardened. The lesser curvature of the stomach was hardened with new growth and the pylorus was greatly narrowed so as only to admit a probe. The other organs were healthy except that the left lung contained several small masses, probably of a malignant character. *See Insp.*, 1877, No. 444.

CASE 145. *Carcinomatous stenosis of pylorus. Deep ulcer extending to peritoneum. Secondary deposit in lungs and mediastinal glands.*—John R., æt. 50, was admitted under Dr. Moxon, on November 26th, 1877, and died on January 2nd, 1878. He was a dock labourer; one brother died of cancer at the age of 55; his wife also died of cancer. Three or four weeks ago he began to vomit his food immediately after ingestion, and he has wasted greatly. On admission, he seemed to be fairly well nourished, and did not look ill. He could take but very little food. The abdomen was very much flattened, and there was a distinct fulness on the right side beneath the right rectus. A hard nodule could be felt between the umbilicus and the ensiform cartilage in the median line. The heart's action was irregular, the urine was free from albumen. He had more than usually obstinate vomiting, and gradually sank. At the autopsy, some of the mediastinal glands were found to be enlarged by cancerous deposit, and there were a few secondary deposits in the lungs. The stomach was small and presented a very tight stricture at the pyloric end, hard and nodular to feel; but on slitting it up it did not show much, except thickening of the muscular coat and a little whitish thickening of the mucous and submucous tissues. On the anterior aspect of the mucous surface, in the middle of the thickened part, was a sharp bordered, punched-out, excavated ulcer, which had made its way through the thickened tissues, so as to nearly reach the surface. Its blackened, discoloured wall was plainly evident beneath the peritoneum, and perforation was not far off. The intestines were much contracted from emptiness. The liver weighed forty-one ounces. The gall-bladder was distended; the spleen weighed three ounces, and was healthy. The heart weighed eight ounces, and was of a brownish colour. The kidneys were healthy. *See Insp.*, 1878, No. 4.

CASE 146. *Carcinoma of cardiac end of stomach. Secondary deposits in liver, pleura, heart, and suprarenals, and in many lymphatic glands.*—Eliza B., æt. 53, was admitted under Dr. Pavy, on January 4th, 1878, and died on March 2nd. She was a laundress who had had good health until eight months ago, when she began to suffer from pain in the cardiac region. She has wasted since. Four weeks ago the abdomen began to swell. On

admission, she was spare, hardly jaundiced, but sallow. There was a large gland above the left clavicle. The liver was enormously enlarged. The urine contained no albumen or sugar. She gradually became more jaundiced and emaciated, and died quietly. At the autopsy the jaundice was very considerable. The pleuræ showed numerous small plates of cancer on the surface, some invading the lungs very slightly. The lungs themselves were jaundiced and œdematous. There was a small nodule of cancer growing from the epicardium into the muscle of the right ventricle. It occupied the usual situation for the friction patch. The lumbar glands were very much enlarged, their material soft and some of it colloid. The receptaculum chyli was invaded from the lower glands and was full of soft, brain-like stuff. Thence the glands upwards were enlarged to the mediastinum but the mediastinal glands were not notably big. The spleen weighed eight ounces, and was healthy and both suprarenal capsules were cancerous, the right being more affected than the left. The peritoneum contained a good deal of fluid without evidence of peritonitis. The stomach was much congested and there was a good deal of puckering in the region of the growth, presently to be described. At the cardiac end, about an inch away from the œsophageal orifice and quite free of it, was a nodular looking, vascular mass of new growth about the size of a five-shilling piece. Some of this had infiltrated the stomach coats, but still retained over it a vascular surface of gastric mucous membrane somewhat altered; but running transversely from left to right was a fissure which on vertical section of the growth showed that all the mucous membrane had gone, and an ulcer with cancerous walls only remained. The rest of the gastric mucous membrane was injected but otherwise healthy. The pylorus was healthy. The tail of the pancreas lay beneath the gastric growth and was healthy but there were some very large glands all along its upper border and adherent to the stomach. These were soft and yellowish and quite like those in other parts. The large and small intestines were healthy. The liver weighed one hundred and eighty-four ounces and was for the greater part infiltrated by a soft yellowish growth. In the right lobe much of the growth had degenerated so as to give on section some large tracts of cancerous material, and these had puckered the surface so as to cause the anterior edge to turn upwards towards the convex surface of the organ. With regard to the ducts and vessels, the portal vein was free from disease as far as could be seen on splitting the various branches up; but the bile-ducts were everywhere remarkable for the thickness of their coats and the rugosity of their mucous membrane; especially was this the case in the larger branches and in the portal canal. The whole gall-bladder was similarly thickened and its mucous membrane quite villous-looking though there were no distinct growths. There was no gall-stone and the gall-bladder was contracted, containing mucus just tinged green with bile. Histologically the growth was a cancer, the cells composing it mostly angular and round. The kidneys weighed thirteen ounces and showed some slight fatty degeneration together with a small, millet-sized deposit of carcinomatous material. *See Insp.*, 1878, No. 86.

CASE 147. *Carcinomatous stenosis of the pylorus. Great dilatation of stomach. Secondary deposits in lymphatic glands.*—John F., æt. 45, was admitted under Dr. Habershon on February 6th, 1878, and died on March 26th. He was a dock-labourer, who for the past two years had suffered from

sickness and eructation after food, with loss of appetite and pain in the epigastrium. He also complained of flatulence and constipation. On admission, peristaltic movements of the stomach could be seen, and later on a tumour appeared in the position of the pylorus. He gradually sank, becoming more and more emaciated, fell into a drowsy condition and died. At the autopsy the viscera generally were healthy, but the stomach was found to be enormously dilated, filling the greater part of the abdominal cavity and compressing the intestines into the pelvis. The walls were considerably hypertrophied and the pylorus much narrowed, so that it would not permit the finger to pass. When laid open, the stenosis was seen to be due to a white, firm growth in the mucous and submucous tissue, having a length of about two inches. There was no ulceration of the mucous membrane over it, though the growth presented a few rounded and oval projections. The muscular coat at the pylorus was very much hypertrophied, but neither the muscular nor the peritoneal coat appeared to have been invaded by the growth. Some glands about the lesser curvature and below the pylorus were obviously cancerous, but there were no other secondary deposits. See *Insp.*, 1878, No. 119.

CASE 148. *Carcinomatous ulcer of pylorus, invading the liver and causing gangrene. Gall-stones.*—Ellen W., æt. 50, was admitted under Dr. Taylor, on February 9th, 1878, and died on April 11th. She was stated to have suffered for ten months before admission with symptoms of dyspepsia, beginning with pain under the left shoulder-blade. On admission, a hard, tender tumour was felt at the pyloric end of the stomach. She sank gradually, and at the autopsy the body was considerably wasted. The heart weighed nine and a-half ounces, and Dr. Fagge remarks, "is less wasted than usual in cancer of the pylorus." The muscle was rather hard. The kidneys were fibroid. The lungs were highly emphysematous. On opening the abdomen, the tumour below the liver was seen as a hard, nodulated mass, adherent to its under surface. The convex surface of the left lobe was mottled with patches of a dirty yellowish-green colour, obviously due to a sloughing inflammation of its substance. After removal, the stomach was laid open, and proved to be healthy till near the pylorus. Here there was a large, round, sloughing ulcer, with hard, raised, white, rounded edge, obviously cancerous. The passage to the duodenum was rendered tortuous, but when one had once found its position, the blade of the enterotome passed easily. The cancerous ulcer communicated with a large, sloughing cavity situated behind it, and hollowed out in the under surface of the left lobe of the liver, and it was this that had set up the sloughy inflammation in the substance of the lobe. The gall-bladder and cystic duct contained about six faceted gall-stones of the size of nuts, but there seemed to have been no connection between them and the local development of the cancer. The right lobe of the liver contained a single small secondary deposit. The rest of the viscera were normal. See *Insp.*, 1878, No. 138.

CASE 149. *Carcinoma of pylorus and duodenum obstructing the common bile-duct. Secondary deposits in liver and lymphatic glands. Granular kidneys. Cerebral hæmorrhage.*—Matthew H., æt. 63, was admitted under Dr. Fagge on April 17th, 1878, and died on May 28th. The patient was an

engine-driver, who for some years worked in lead works, and thirty years ago had suffered from lead colic. Eight months ago he had pains all over him, probably of rheumatic character. Six weeks before Christmas he had cramping pains in the abdomen which bent him double, and these came on now and again till ten weeks before admission, when he began to be jaundiced and was attacked with frequent vomiting with wasting. On admission, he did not appear to be much wasted, but was of a yellowish green colour, and a lump could be felt in the right hypochondrium. The liver appeared to be large and hard. The urine was free from albumen. He passed into a weak, drowsy condition, and died out with a bad bed-sore, which was somewhat relieved by the application of a silver plate to it. It was not known whether he had any hemianæsthesia, as he was in a drowsy condition for some time. At the autopsy the body was not remarkably emaciated and there was a considerable bed-sore over the sacrum. There was a hæmorrhage in the left optic thalamus. The heart weighed eleven ounces, and the kidneys were granular. The aorta was atheromatous and the cerebral vessels were atheromatous in a very remarkable degree. The pleuræ were adherent, and the lungs œdematous. When the abdominal cavity was opened the omentum was found to be thickened by a cancerous growth, and there was some local capsulitis over the spleen. The stomach was about normal in size and the muscular coat was only thickened in the pyloric segment. On opening the viscus, a finger passed with some difficulty through the pylorus owing to a general nodular thickening of the mucous membrane of the pylorus and the duodenum. This made the surface of the affected part extremely rugose, and at the free border of the growth towards the stomach were some discreet, pea-sized nodules of deposit in the submucous tissue. The cancerous thickening extended as far as the orifice of the common duct in the duodenum. The common bile-duct was completely blocked by growth about an inch from its termination. It contained a dark, blackish, mucoid fluid, which gave the reactions of albumen, and with nitric acid a faint play of colours. The ducts of the liver were much dilated. The liver contained several small cancerous nodules all over it, and the gall-bladder was full of thick black bile. The portal vein ran through a mass the size of a foetal head, beside the stomach, in front of the aorta. It was free from obstruction. The pancreas was healthy though enclosed by the new growth. There were no gall-stones. See *Insp.*, 1878, No. 198.

CASE 150.—*Carcinoma of pylorus and lesser curvature of the stomach. Secondary deposits in peritoneum and lymphatic glands. Acute pneumonia.*—Solomon B., æt. 49, was admitted under Dr. Fagge on April 3rd, 1878, and died on June 1st. For the last few years the patient has been a free drinker. Ten weeks ago he fell downstairs and immediately afterwards he complained of pain in the stomach, which has continued ever since. Three weeks later he began to vomit his food. On admission a roundish mass was felt to the right of the umbilicus corresponding exactly with a scirrhus pylorus. The stomach filled the epigastric region; there was occasionally visible peristalsis. He sank gradually, for some time before his death lying in a half unconscious state, from which he could be roused with difficulty. At the autopsy the heart weighed eight ounces, and "the muscle of the left ventricle," says Dr. Fagge, "was harder and firmer than usual in such cases." The kidneys were thought to shew interstitial nephritis. The lungs were healthy, except for

some hepatization at the lower part of the left upper lobe. The contents of the abdomen were shrunken, the pylorus being occupied by a mass of cancer, which encircled it, but more thickly on its posterior surface. The mass grasped the finger tightly but allowed an enterotome to pass. It was ulcerated, the hypertrophied muscular coat being exposed in the floor of the ulcer, which towards the gastric cavity had everted, sinuous, fungating edges. The cancer extended along the lesser curvature to the œsophageal orifice, thickening the stomach and preventing it from dilating. The muscular coat was much thickened. There was also much cancer in the form of small nodules in the omentum along the greater curvature and extending throughout the mesenteric glands, many of which were caseating. The liver weighed thirty-five ounces and was much wasted. It was free from secondary deposit. The spleen weighed two ounces and was small. See *Insp.*, 1878, No. 206.

CASE 151. *Carcinomatous stenosis of cardiac orifice of stomach.*—Richard W., æt. 48, was admitted under Dr. Wilks, on September 9th, 1878, and died on September 16th. About five months ago the patient swallowed a piece of meat, which appeared to stick in his throat, at the level of the top of the sternum. The patient stated that this remained for nine days, during which he could take no solid food. On the ninth day, when endeavouring to eat some dry biscuit, he felt the obstruction give way, and he could then swallow without difficulty. Since this time he has often felt a slight constriction in the same situation when swallowing, and sometimes a piece of food would stop there for a day or two, and then suddenly pass on; if not, it was returned by the mouth. About three weeks ago this became much worse, and he has since then only been able to take liquids. He has never suffered any pain. On the day after admission, Mr. Bryant performed the first stage of gastrostomy, fixing the stomach to the abdominal wall, but not opening the cavity. After the operation, the patient was able to swallow without difficulty a pint and a-half of milk, and afterwards, some biscuits. He, however, gradually sank, and died without obvious cause seven days after the operation, the stomach itself not having been opened. At the autopsy, no malignant growth was found anywhere in the body, and the organs were normal, except the cardiac end of the stomach and the lower end of the œsophagus. There was, however, some local peritonitis about the stomach, corresponding to the situation of the abdominal wound. The stomach and lower end of the œsophagus are preserved, and from Preparation 688, described as follows:—"A stomach, with a portion of the anterior abdominal wall, to which it is firmly adherent. The organ has been laid open from behind, and shows a small growth about one and a-half inches in diameter, encircling the œsophageal opening, and invading the last inch of the gullet. It has destroyed the mucous membrane, invaded the parts beneath, and appears as a prominent mass externally. On the anterior wall of the stomach there is a depression corresponding to its point of attachment to the abdominal wall (preliminary to gastrostomy). Histologically, the growth is a spheroidal-celled carcinoma." See *Insp.*, 1878, No. 351.

CASE 152. *Carcinomatous stenosis of the pylorus.*—John McK., æt. 43, was admitted under Dr. Fagge on September 14th, 1878, and died on September 19th. Four and a half months before admission, when in Madras, he suffered

from heart-burn, eructations, and great pain in the epigastric region. He was then a stout and apparently healthy man. He lost flesh considerably during the month that he suffered from these symptoms. After three weeks interval of health, symptoms returned accompanied by sickness. Has been gradually getting worse. On admission, the skin was pale yellow. Patient much emaciated, almost moribund and vomiting everything. A lump was felt in the abdomen. The stomach was not much distended. He was kept alive by nutrient enemata till the 19th, when he died of starvation. At the autopsy the body was slightly jaundiced and the viscera generally were very anæmic. The heart weighed nine ounces and was somewhat wasted. The abdomen was remarkably retracted, the intestines not being larger than those of an infant a few weeks old. There was no growth in the omentum, mesentery, or other parts. The œsophagus was quite healthy and the stomach much distended, stretching downwards vertically in the middle line on the left side of the abdomen. The pylorus was apparently invaginated into the stomach and contained a quantity of black grumous material. The coats were much thickened generally but especially towards the growth. The pyloric orifice was nearly closed, barely admitting a No. 8 catheter. The whole tissue was much thickened by scirrhous material. The thickest part of the growth was the pylorus itself, whence it gradually diminished in thickness towards the left. It was ulcerated and sloughing in parts. There was no extension of the growth into the duodenum, the line of demarcation on the duodenal side being extremely sharp and abrupt. There was no glandular affection. The liver weighed fifty-four ounces and was quite healthy. The spleen weighed six ounces and was healthy, and the kidneys were also healthy. *See Insp.*, 1878, No. 355.

CASE 153. *Carcinoma of pylorus and lesser curvature of stomach invading the liver. Pleurisy. Perihepatitis.*—Richard C., æt. 54, was admitted under Dr. Goodhart on June 19th, 1878, and died on October 30th. He was an engineer's labourer, and sixteen years previously had been successfully operated upon by Mr. Bryant for the crushing of a stone in his bladder. Two and a half years ago he began to suffer much pain after his food, the pain being situated in the epigastrium. Two years ago he brought up blood and had mælena. He was then in bed four months. Fourteen weeks ago the pain in the epigastrium increased but he has had no vomiting. He was very anæmic with an ill-defined but somewhat extensive mass in the epigastrium, tender on pressure. There was a rub heard over the liver. He continued in much the same state varying very little till three or four days before his death when he complained of very severe abdominal pains which required repeated doses of opium. At the autopsy the body was spare but not remarkably emaciated and the heart weighed nine and a half ounces. "The subpericardial fat," says Dr. Goodhart, "had undergone gelatinous or mucoid degeneration." Both pleuræ contained about a pint of fluid and there was recent lymph on the surface of the lungs. There were no secondary deposits in the thorax or elsewhere. On the right lobe of the liver was some recent lymph near the median line. The entire lesser curvature of the stomach was occupied by a ragged carcinomatous ulcer which had an indurated everted edge and numerous bosses of new growth projecting from its surface. Parts near the pylorus were black and sloughy-looking. Near the pylorus the growth extended completely round the stomach and thence extended along the anterior wall as

a spur. The pyloric ring was widely patent admitting two fingers easily. The cardiac part was not dilated. The stomach was firmly adherent to the diaphragm and to the under surface of the left lobe of the liver and on vertical section the liver was found to be invaded by cancer, the hepatic capsule having quite disappeared at the part. There was a small diseased gland in the portal fissure. The bile-ducts in the fissure were remarkably dilated but no obstruction now existing or bygone could be found. The liver was healthy but small, weighing thirty-eight ounces. The cancer of the stomach was too far advanced to give any indication of its origin. The growth consisted of large epithelial cells and in the deeper part was distinctly alveolar and carcinomatous, the alveolar walls being fibrous and the cellular element rounder and smaller than those of the main growth. The spleen weighed six ounces and was adherent to the diaphragm. The kidneys weighed nine ounces, the right being shrivelled up, the pelvis dilated, the ureter somewhat contracted and its walls thickened. The bladder was perfectly healthy and also the whole length of the urethra. See *Insp.*, 1878, No. 415.

CASE 154. *Carcinoma of the lesser curvature and middle zone of the stomach. Erosion of coeliac axis; fatal hæmatemesis. Secondary deposits in glands and peritoneum.*—John B., æt. 64, was admitted under Dr. Habershon on October 2nd, 1878, and died on November 2nd. Three months before admission he began to suffer from pain in the stomach after food. For the last month he has only taken fluids. His body was much wasted but he has not been sick. The patient complained of a dull aching pain in the left hypochondrium and epigastric region, and a tumour was felt in that situation which increased in size. For a time he appeared to improve and was up the day before his death. At 2 a.m. on the morning of the day on which he died the night-nurse found him coughing a good deal. He brought up four ounces of blood and expired very quickly. At the autopsy the body was found to be considerably wasted and the lower lobes of the lungs were highly œdematous. There was a small caseous relic at the apex of each lung and the trachea contained a little blood-clot. The heart weighed nine ounces and was in a condition of brown atrophy. On opening the abdomen the stomach was seen adherent to the under side of the left lobe of the liver and indurated, forming the tumour which had been felt during life. Subsequently the disease was found to have invaded the middle of the organ. Both the orifices were free. There was a large cancerous ulcer occupying the whole circumference of the stomach, with raised festooned edges. It had puckered the organ so that the distance between the cardia and the pylorus was very much lessened and the whole stomach was very small. At the lesser curvature there was a deep sloughing cavity, which was afterwards dissected by Mr. Wood who found that the trunk of the coeliac axis was perforated just at its division, the splenic artery being freely opened. A probe passed into the coeliac axis from the abdominal aorta passed on into the cavity of the stomach through this sloughing cavity. The stomach itself contained nearly a porringer of blood. Some glands along the greater curvature of the stomach were much enlarged and cancerous, and there were also many nodules of growth beneath the peritoneum about the pancreas. Microscopically the growth appeared to be a true carcinoma. The kidneys were healthy. See *Insp.*, 1878, No. 419.

CASE 155. *Carcinomatous infiltration of the stomach and lesser omentum. Secondary deposits in liver and lymphatic glands. Venous thrombosis. Pulmonary embolism. Pneumonia. Old and recent endocarditis.*—Charles A., æt. 64, a toy-maker, who had always enjoyed good health, was admitted under Dr. Fagge in an extremely anæmic state with profuse diarrhoea. The patient's illness began gradually; his legs and abdomen became swollen and he attended Dr. Fagge's out-patients for some weeks. He then became an in-patient at St. Bartholomew's Hospital and came out three months ago. He got a little better. He was then seized with diarrhoea and was admitted in the condition previously described, cold and collapsed-looking and as if he were dying. There was some acites with œdema of the legs. No tumour could be detected. He was supposed from his appearance to have some abdominal cancer. His urine was a little albuminous once. His motions improved in consistence but remained white. October 29th, a musical systolic bruit was heard at the base of the heart. On November 9th the motions were black. He was admitted on September 28th and died on November 11th. At the autopsy the body was found to be much emaciated and there was still slight œdema of the legs and a considerable quantity of fluid in the abdominal cavity. The lesser omentum was occupied by a large mass of yellow-looking growth. On looking into the stomach a growth was found to invade the stomach, involving its coats from the pylorus to the cardia. It was sloughing on the surface. Towards the pylorus the whole circumference of the stomach was involved and the stomach was adherent at the lower margin to the colon. A section of the growth showed a large mass at the lesser curvature some two inches thick, its surface sloughing at parts and caseous at others, and the deeper parts of the soft portion exuded a copious milky fluid. The pylorus was not obstructed. There was no evidence of old ulceration. The liver weighed forty-three ounces. Its capsule was thick and its surface somewhat altered by contraction of it. "I found," says Dr. Goodhart, "two minute secondary deposits in the portal fissure." The portal fissure was somewhat thickened and adherent but the veins were not obstructed. The gall-bladder was full of thick, mucoid, pigmentary matter evidently on the way to the formation of a gall-stone or gall-stones, but at present there was merely pasty, matted material without definite concretion. The spleen weighed three ounces and was quite healthy. One suprarenal contained a small mass, possibly a secondary deposit. There was considerable pneumonia and the heart, which weighed twelve and a half ounces, showed old and recent endocarditis. There was some ante-mortem thrombus in the poststatic plexus and in some of the tributary veins of the femoral on one side. The kidneys, which weighed eight ounces were smooth on the surface but contained a large number of small cysts. *See Insp.*, 1878, No. 432.

CASE 156. *Stomach invaded by growth of the colon. Gastro-colic fistula.*—Edward W., æt. 66, was admitted under Mr. Durham on March 18th, 1879, and died on March 22nd. No report of the case could be found, but Dr. Goodhart learned that the patient was sent up as a case of intestinal obstruction by Dr. Hooper, of Trinity Square, and that he had had occasional attacks of abdominal pain. He vomited some faecal-looking stuff but there were no absolutely definite symptoms of obstruction, and nothing therefore was done of a surgical nature for his relief. At the autopsy there were a few suction

bands on the various coils of intestine but no other evidence of peritonitis. There was no distension of any part of the intestine, "indeed," says Dr. Goodhart, "I had followed up the whole length of the intestinal tract without finding any obstruction and was proceeding to remove the intestine somewhat less carefully when an adhesion was torn through between the colon and the stomach and a quantity of faecal matter came out." On removing the parts it was found that the splenic flexure of the colon, or rather the splenic curve of the transverse colon, was affected by cancer and that it had formed an adhesion with the stomach and so practically formed the lower wall of that viscus, that is to say, a cancerous mass in the colon had caused adhesion between it and the stomach, and converted the two cavities into one. On removing this part the adhesion between the colon and the stomach being broken, the colon looked as if it had lost about two inches of its length and there was a large gap in the cardiac end of the stomach about three inches by two. Its edges were thickened and invaded by a new growth which on section was much of it yellow and degenerating. The stomach contained faecal-looking and smelling contents. It was impossible now to say where the disease had commenced but seeing that the colon was more affected than the stomach and that it is a part more commonly affected even at the splenic flexure than the cardia, it was probable that the colic disease was primary and the gastric secondary. In the omentum there was a little new growth by direct extension but no secondary disease anywhere else. The lungs were atrophied, the mitral valves thickened, the spleen matted up with the disease and its capsule thickened in many places but its structure healthy. The suprarenal capsules and liver were healthy and the kidneys were very good. The bladder was healthy but there was a sloughy mass round the prostate and in the cellular tissue between the bladder and the rectum apparently due to a large ulcer of recent character in the rectum. See *Insp.*, 1879, No. 109.

CASE 157. *Carcinoma of the pyloric end of the stomach. Carcinomatous peritonitis. Secondary deposits in umbilical vein and at umbilicus.*—Benjamin D., æt. 44, was admitted under Dr. Wilks on May 12th, 1879, and died on May 23rd. The patient was a butler, who in the previous summer had begun to suffer from tenderness and slight pain in the region of the stomach. About Christmas he began to suffer from indigestion and his bowels became confined. He noticed a small, brown, warty-looking growth about his umbilicus. This was excised by Mr. Hutchinson on March 3rd. The wound healed well and he was discharged on March 13th. From that time he had pain in the back, constipation, and sickness. The food would remain in the stomach some hours and then return. He had been losing flesh since January. On admission the abdomen was distended and fluctuation could be felt in it. There was hardening around the umbilicus. Some hard lumps could be felt in the upper part of the abdomen. He gradually sank and died, and at the autopsy the body was found to be considerably emaciated. At the umbilicus and in the connective tissue near it there were two or three hardish, fibroid-looking nodules, white, but dry and juiceless. The peritoneum contained a considerable quantity of straw-coloured fluid. It was thickly covered with small, flat granules of cancer, many of them pigmented in their centre. There was much puckering and adhesion. The mesentery was very short and the lower coils of the small intestine were adherent together in a

small, closely twisted mass. The large intestine was also much invaded by adhesions in many places. The lumps that had been felt proved to be scybalous masses in the colon. There were cancerous growths along the portal vein and at the fissure of the liver, and to a remarkable extent along the obliterated umbilical vein, "but the only place in which I could make out any definite affection of a viscus likely to have been the starting point of the cancer was in the posterior wall of the stomach close to the pylorus. Here the mucous membrane was much puckered, the muscular coat greatly hypertrophied, and the connective tissue thickened, my decided opinion being that this was the primary lesion." The liver was healthy. The heart weighed seven ounces, being in a condition of brown atrophy. See *Insp.*, 1879, No. 199.

CASE 158. *Sarcoma of stomach and peritoneum. Secondary deposits in Fallopian tube and cæcal appendix. Laparotomy. Suppurative peritonitis. Endocarditis.*—Jane N., æt. 41, was admitted under Dr. Moxon on June 2nd, 1879, and died on July 7th. On admission she was found to be suffering from ascites the dulness being localised to the lower region of the abdomen and it was thought to be ovarian by those who sent her up. However, it was not evidently so when in the ward and Dr. Galabin thought that the fluid was in the peritoneum. She had a good deal of diarrhoea but no sickness. On June 13th, the abdomen was opened for exploration and a mass being found in the neighbourhood of the transverse colon, the wound was closed again. The wound was healed by the 28th, her temperature at that date being 99·8°. On the 30th, her temperature rose to 103° and continued pyrexial, varying between 101° and 104·2°, until her death on July 7th. At the autopsy, the body was found to be considerably wasted and the peritoneum to contain a large quantity of fluid, turbid and semi-purulent. The coils of small intestine were all matted together in one mass and coated over with lymph. This was of recent origin and the coils were easily separable. This condition would explain the fact that the case simulated ovarian disease supposing that the ball of matted intestine was all bound down close to one particular part. They were not now so fixed, at any rate, in the region where dulness had been observed during life, namely, in the left inguinal region. They were rather placed on the spine round the mesentery. The chief disease was one of the stomach. The viscus was converted into a thick walled, contracted cavity throughout, except a small portion of its cardiac end. Its contents were a little yellow grumous liquid. A vertical section of its coat from the peritoneum outwards showed a little sub-peritoneal white growth, then an enormously thick layer of muscle, then a large layer of white perfectly juiceless submucous growth of new formation on the top of which lay the mucous membrane of the stomach looking fairly healthy. The diagram given by Dr. Goodhart shows that the total thickness of the wall was about an inch. "The white growth," says Dr. Goodhart, "under the microscope was composed of small round cells and some spindle cells and appeared to be of the nature of sarcoma." From the stomach the disease had spread to the peritoneum, producing granular deposit. One gland in the portal fissure was affected. The intestine was quite healthy except the cæcal appendix which was swollen to the size of a little finger and its mucous membrane much thickened. The liver was healthy, the spleen weighed

three ounces. The mitral valve was thickened and there was a bunch of recent vegetation on both flaps of the valve. The arteries were a little thickened and the tricuspid and pulmonary valves also. The pelvic viscera were all healthy except that they were matted together by thick lymph and caseous semi-purulent material which had collected in the pelvic pouch. The left Fallopian tube, too, near its extremity, was thickened and infiltrated by new growth. See *Insp.*, 1879, No. 245.

CASE 159. *Diffuse carcinoma of the stomach chiefly affecting the pylorus. Slight colloid change.*—Thomas W., æt. 47, was admitted under Dr. Wilks on June 18th, 1879, and died on August 14th. The patient had had syphilis two years before admission, and twelve months ago he began to be sick after taking food. His bowels had been very irregular. On admission he was emaciated and a swelling the size of a hen's egg could be felt in the right half of the epigastric region, which moved with respiration. His temperature was normal. On June 24th it was noted that he had not been sick since admission. On July 1st, occasional sickness. July 21st, sickness almost every night. 28th, sick after everything. He died gradually exhausted and at the autopsy the body was found to be remarkably emaciated. The vertebræ showed very considerable osteo-arthritis nodulation. The stomach was moderately contracted, the coats in all parts being thick and leathery, chiefly from muscular hypertrophy. The pyloric two inches was much more thickened than the rest and the peritoneum over it covered by irregular plates of white growth. Opening the cardia and passing one's finger towards the pylorus, it was arrested at the thickened part by a rounded swelling like a swollen os uteri, with patulous cervix which would just admit the little finger tip, but would not allow its passage. An enterotome passed easily enough. When opened up the thickening was found to consist of a smooth whitish growth in the submucous tissue of the stomach, a much thickened muscular layer, and a little thickened peritoneal coat. The mucous membrane over the growth was peculiar. It was pretty smooth but yet had small ulcers on it. One of these near the pylorus was oval, sharply edged, and led into a small cavity containing pus, which seemed more like a vein or vessel containing pus than any softening growth, though it may have been an abscess of some date. On close inspection of the surface of the growth it was seen to be studded over with small grey pearly grains as if some colloid change were present. There was no evidence of any chronic ulcer. The edge of the disease was crescentic and serpiginous and extended into the mucous membrane a considerable distance beyond the actual thickening above noted, so that the lines were laid for one of the diffuse forms of cancer of the stomach rather than for any localized growth. The mucous membrane over the lesser curvature was abnormal, being thin and ecchymosed and puckered as if there might have been some former ulceration. The liver weighed fifty-eight ounces and was healthy, and the spleen weighed three and a half ounces. There was considerable old adhesion all over the capsule of the liver between that viscus and the diaphragm. The pericardium was adherent by silky adhesions, and the heart weighed fourteen ounces, being healthy. The lungs were rather cedematous; the suprarenal capsules and the kidneys were normal. See *Insp.*, 1879, No. 289.

CASE 160. *Carcinomatous ulcer and stricture of the pylorus. Hypertrophied and contracted stomach.*—Sarah C., æt. 47, was admitted under Dr. Fagge on August 6th, 1879, and died on October 7th. She had always enjoyed good health till twelve months before admission when she began to suffer from indigestion and pain between the shoulders. At Christmas she noticed a small lump about the size of the top of a thumb to the left of the umbilicus, and also had pain in that situation. She soon began to vomit after taking solid food. She has never vomited blood. She was admitted for the vomiting and a hard lump to the left of the umbilicus. It was circular, slightly convex and freely movable. She complained of constant hard gnawing pain in the tumour aggravated by pressure. The movements of the stomach were visible. At the autopsy there was slight œdema of the legs and feet and the body was much emaciated. The lungs were very dry and bloodless and the heart weighed only three and a half ounces, being, Dr. Goodhart remarks, a good specimen of brown degeneration. The peritoneum was healthy, but on opening the abdomen the stomach was seen to be to the left of the spine and moderately contracted. The pylorus, although adherent by the natural connection to the front of the spine, was dragged over so as to lie on its left side. The stomach was contracted a good deal in all parts, mostly at the pyloric end. It contained nothing except mucus. The coats were much thickened and tough, the muscular coat being particularly thick. The mucous coat was red and mammillated. At the pylorus was a tight stricture which only admitted the tip of the little finger with difficulty and on cutting it open it was seen that the passage was sinuous. The specimen is preserved in the Museum and is thus described:—"A portion of a stomach showing on its posterior wall just within the pylorus a deep ulcer in the base of which the muscular coat of the viscus is exposed. The edges of the excavation are abrupt and thick and are infiltrated by a growth which extends for about two inches into the body of the organ. The orifice of the pylorus is narrowed. Histologically the growth is a cylindrical celled carcinoma." The surrounding glands were quite healthy and the portal fissure was free from disease. The liver was wasted, weighing twenty-three ounces, but was otherwise healthy, and the spleen weighed only one ounce. See *Insp.*, 1879, No. 370, and *Prep.* 687.

CASE 161. *Sarcomatous ulcer of cardiac end of stomach invading the spleen and causing fatal hæmatemesis. Secondary deposits in glands.*—Charles B., æt. 55, was admitted under Dr. Wilks on December 4th, 1879, and died on December 15th. When admitted he was thought to be in a dying condition from hæmatemesis, and in that state he remained for a day or two, then rallied and seemed to be getting round, when he became collapsed and died as if from fresh hæmorrhage. He had suffered from dyspepsia for two years and his symptoms had become more pronounced. At the autopsy the body was spare and very much blanched. The lungs were somewhat emphysematous and the heart weighed twelve ounces, the aortic valve being somewhat thickened. The stomach was found to contain about a pound of blood clot of recent formation, and this evidently proceeded from a large cancerous ulcer at its cardiac end. This occupied an area some three inches square and had an everted edge which was very hard and irregular. The floor of the ulcer was outside the stomach and contained a quantity of grumous blood, and

on making a vertical section of the floor, "I found," says Dr. Goodhart, "that the growth was making its way outwards from the stomach and had attached itself to the spleen and had then ulcerated into the splenic pulp, so that the floor of the ulcer was formed by spleen tissue in a broken down condition and the source of the hæmorrhage was explained." About half the upper part of the spleen was destroyed in this way. The parts all round were adherent, so that no escape had taken place from the stomach into the peritoneum. The edges of the cancer were very hard, and on section were composed of white and grey growth of tough consistence, giving off no juice on scraping. "It appeared," says Dr. Goodhart, "to be a fibro-sarcoma." All the other viscera were healthy, except the glands at the lesser curvature. These were very large from a deposit of growth. See *Insp.*, 1879, No. 469.

CASE 162. *Carcinoma of pyloric end of stomach. Secondary deposits in glands.*—Thomas G., æt. 42, was admitted under Dr. Fagge on October 17th, 1879, and died on February 15th, 1880. For nine months before admission he had suffered from pain in the stomach of a continuous character, loss of flesh, and vomiting half an hour after meals. On admission he was very anæmic and sallow and often vomited altered fluid. "No definite diagnosis," says Dr. Fagge, "was made as between ulcer and carcinoma of the stomach." At the autopsy the body was found to be extremely emaciated and the pyloric end of the stomach was adherent to the under surface of the liver and greatly enlarged and indurated. About it were some enlarged glands occupied by an opaque white growth. The pylorus itself would just admit the forefinger. It and the adjacent part of the stomach over a surface as large as the palm of the hand were occupied by a large, fungating, cancerous growth. This growth did not invade either liver or pancreas and there were no secondary deposits except in glands above mentioned. Both lungs were œdematous and the heart was small and in a condition of brown atrophy. The liver, kidneys and spleen were healthy. See *Insp.*, 1880, No. 78.

CASE 163: *Carcinoma of pylorus with secondary deposits in glands, liver and peritoneum. Tuberculous knee-joint.*—Charles V., æt. 62, was admitted under Mr. Howse on March 3rd, 1880, and died on March 13th. The patient was admitted for an effusion into his right knee-joint, the history being that fifteen months previously he had struck his knee with a hammer, causing him great pain, which passed off. Seven months ago he noticed a return of pain; he was treated for rheumatism. For the last two or three months he had often been sick. At the autopsy the right knee-joint was found to be affected with tuberculous disease. Both upper lobes of the lungs were œdematous. The pyloric end of the stomach was narrowed by a white, firm, cancerous growth, superficially ulcerated at one spot, and with a good deal of hypertrophy of the muscular coat. The peritoneum over it showed a few grains of flat nodules of growth. There were also two small, white cancerous nodules in the liver, and secondary deposits in some of the lumbar glands and in the glands about the head of the pancreas. The liver and spleen were healthy. Dr. Fagge states that the microscope showed this to be a true carcinoma, for abundant epithelial cells were contained in the white subserous part of it. "On the other hand, in the submucous part, although an alveolar structure was apparent, the matrix was so thickly set with round cells that I at first hesitated as to whether it might not be a sarcoma." See *Insp.*, 1880, No. 117.

CASE 164. *Sarcoma of pancreas invading the stomach. Chronic peritonitis. Thrombosis of inferior vena cava.*—John T., æt. 49, was admitted under Dr. Pavy on April 2nd, 1880, and died on July 23rd. He had been ill for six months with pain in his left side, and on admission a mass was felt deeply in front of the spine. Later on ascites supervened, with cedema of the lower limbs. At the autopsy there was a considerable amount of ascites and of dropsy, the lungs also being cedematous. The inferior vena cava was closed by old thrombosis. The peritoneum, as above remarked, contained a large quantity of fluid and the liver was much deformed by perihepatitis and had an opaque contracted capsule. "I do not think," says Dr. Fagge, "that this started from the local lesion of the stomach." The stomach had its posterior wall infiltrated by a soft, white, sarcomatous growth, which seemed to have started from the pancreas. There was also a suppurating cavity behind the stomach with a perforation from which a currant-skin passed on squeezing it. "The growth," says Dr. Fagge, "was a sarcoma made up of large, oval nuclei, granular matter, &c." See *Insp.*, 1880, No. 272.

CASE 165. *Carcinoma of pyloric end of stomach. Secondary deposits in omenta, peritoneum, liver, and abdominal and mediastinal lymphatic glands. Pulmonary thrombosis.*—William V., æt. 58, was admitted under Dr. Goodhart on April 7th, 1880, for symptoms of disease of the stomach from which a month later he died. Eight years before admission the patient had had an abscess in the leg which took a considerable time in healing and he had often suffered from rheumatic pains. Four months ago he first noticed pain in his abdomen extending all round the back. Vomiting commenced six weeks ago. He has passed blood in his motions for years. He was admitted with a large hard mass in the abdomen and constant vomiting; he wasted rapidly. At the autopsy the body was much emaciated and there were some nodular excrescences at the junction of the bodies of the vertebræ and intervertebral substance all down the spine. There were a good many old brown scars upon the legs. The testes were normal. The stomach, which was not dilated, was found invaded at its pyloric end by a mass of cancer which puckered the part very much and thickened the omentum externally in the neighbourhood. There were a few small nodules of secondary deposit in Douglas's pouch and in the peritoneum in the region of the liver and kidneys. The lesser curvature of the stomach was also occupied by a thick mass of growth but here it was separated from the wall of the stomach and appeared to be an extension of the mass from some of the glands in the portal fissure. The coats of the stomach were very thick but for the most part the mucous membrane was healthy till the pyloric quarter was reached. Here there was a large, sloughy, cancerous cavity which excavated the walls of the stomach all round the front of the pylorus and separated in this way the pyloric orifice from the growth. Looking at the duodenal mouth of the pyloric surface it was seen pushed to the side and very small. Its walls thick, while the wall of the cancerous cavity was quite separated from it in front. There were several enlarged glands in the portal fissure surrounding the vein and duct partially, that is, they were situated behind and on either side of them but not in front. There was no obstruction. The growth ran along the top of the pancreas but this was quite healthy. The liver contained many round

umbilicated masses of soft growth which in several places were undergoing necrosis. The liver was also lardaceous in a peculiar way: instead of staining generally in a streaky fashion it stained in sharply defined dots in many parts just like the Malpighian corpuscles of the spleen or the tufts of the kidneys. The lumbar glands were very large and stuffed with soft milky growth, the suprarenal capsules healthy, the kidneys healthy except for early doubtful lardaceous change. The lungs were emphysematous and two of the main branches of the pulmonary artery of the right lower lobe had an adherent ante-mortem coagulum. There were several large, white, fleshy glands infiltrated with growth in the mediastinum, the pericardium being healthy. The heart weighed seven and a half ounces and all its valves were thickened from chronic endocarditis. See *Insp.*, 1880, No. 182.

CASE 166. *Carcinoma of lesser curvature of the stomach. Secondary deposits in uterus, ovary, liver and lymphatic glands. Thrombosis of portal veins and vena cava. Obstruction of bile ducts.*—Matilda B., æt. 31, was admitted under Dr. Goodhart on May 24th, 1880, having always enjoyed good health until eighteen months ago, when she began to vomit, and this has continued at intervals ever since. Six weeks ago she began to be jaundiced. She has subsisted for some weeks on slops alone. She was much emaciated, with a swollen abdomen containing a hard mass of cancer below the stomach. The urine was scanty in quantity and contained much bile. The skin was a bright canary yellow. The patient vomited everything she took, and though enemata were given she soon became unable to retain them. She died a week after admission, and at the autopsy the body was found to be much emaciated and the peritoneum contained some ascitic fluid, though not considerable in quantity. The ascitic fluid was straw-coloured, a little jaundiced, but not bloody. The peritoneum was studded all over with masses of tubercular cancer; the mesentery was much infiltrated and the omentum also. The latter surrounded the transverse colon in a mass which was firmly adherent to the abdominal wall. In fact, all the viscera in the upper part of the abdomen were so coherent as to necessitate their being removed altogether. The upper part of the liver was adherent to the diaphragm at the right lobe and was encased in a mass of cancer, and the under surface was adherent to the stomach. After much dissection it was separated and then it was found that the stomach was dilated and full of black material, altered blood, and grape-skins to the amount of nearly two pounds. A great part of the mucous membrane of the stomach, the lesser curvature particularly, was covered with tubercles of soft growth of all sizes. The disease extended thence outward into the portal fissure along the coats of the intestine and down into the mesentery and omentum. The pylorus, though not free, was not specially affected. The portal vein was quite plugged by a cancerous thrombus and the whole length of the splenic vein by ordinary clot. The common duct was also quite obstructed. Up to a certain spot it was dilated and contained bile; below it, none. The orifice of the duct in the duodenum was rendered prominent by a large nodule of cancer in the papilla. The liver was deeply jaundiced and it was small. There was not the slightest dilatation of any of the ducts. The ducts still contained bile. There was some faintly coloured mucus in the duodenum and black faeces in the rectum. There were streaks of cancer in many parts of the liver due to

the disease going along the interlobular septa. The spleen was healthy and firm. One of the supra-renal capsules contained secondary deposit and the sympathetic nerves were involved in tough new growth. The inferior vena cava, from its emergence from the liver to the origin of the renal vein, contained numerous fleshy masses of adherent clot lying here and there in the channel. The clot was not apparently cancerous nor was the vein invaded by growth. There was clot, too, at the orifices of the renal veins, but Dr. Goodhart remarks: "I do not think the veins were plugged completely." The uterus contained a firm growth in its wall, which was thought to be a secondary deposit, and the right ovary was enlarged by growth, which was softened into a cyst containing blood-clot at one part. There was a small cancerous gland at the lower end of the œsophagus. The lungs were œdematous and the heart, which weighed six and a half ounces, was healthy. *See Insp.*, 1880, No. 209.

CASE 167. *Carcinoma of lesser curvature of stomach. Cancerous thrombus of gastric and portal veins. Secondary deposits in liver.*—William T., æt. 58, was admitted under Dr. Pavy in July, 1880, and died about a month later. No clinical account of the case is preserved. At the autopsy the peritoneum was free from fluid but on the under surface of the liver between it and the stomach was a thin layer of clot which seemed to have oozed from a cancerous boss in the liver. There was also much obvious cancer about the lesser curvature of the stomach. When the stomach was laid open there was found to be a large warty-looking cancerous growth forming a patch the size of one's hand at its lesser curvature. This was covered all over with a yellowish-brown, granular, diphtheritic-looking material and appeared to be sloughing, but on cutting into it the tissue was pinkish grey up to nearly the surface. It was covered all over with rounded villous excrescences. The liver was of great size and was full of large tubera and bosses of pinkish cancer many of which had blood extravasated into their tissue. The trunk of the portal vein of the liver had growing into it large rounded masses of carcinomatous thrombus, "which, I think," says Dr. Fagge, "must have closed its channel in both main branches. Below this the veins were free but the veins of the gastric mucous membrane on each side of the large cancerous patch were dilated and tortuous and filled with a creamy, soft thrombus, itself no doubt cancerous." The heart showed a moderate degree of wasting. The lungs were dry and shrunken, the spleen was healthy and the kidneys also. *See Insp.*, 1880, No. 275.

CASE 168. *Carcinoma of pyloric end of stomach. Secondary deposits in ovaries, peritoneum, and lymphatic glands. Ascites.*—Jane C., æt. 48, was admitted under Dr. Pavy on September 7th, 1880, and died on September 22nd. She had been ailing for five months before admission with dyspeptic symptoms, flatulence after food, anorexia, etc. The last three months she has kept her bed. She has noticed a swelling in the abdomen of late and has lost flesh. On admission the abdomen was found to be much distended and the legs were œdematous. She was greatly emaciated and there was dulness at the base of the left lung. The urine was scanty and high-coloured and the bowels constipated. Paracentesis abdominis was performed on the day of admission, and one gallon of clear fluid was drawn off. A large tumour was

discovered above the pubes, more to the right than on the left side of the abdomen. It could be felt per vaginam, but appeared not to be connected with the uterus. On the 18th she was tapped again and seven pints were drawn off. She subsequently sank rapidly and died. At the autopsy the body was greatly emaciated and the abdomen was distended, and there was some cedema of both lower extremities. The peritoneum showed general purulent peritonitis. On laying open the stomach, which was contracted and contained a little food, the little finger passed with difficulty through the pyloric orifice, and on cutting this open the pyloric end of the stomach was found to be infiltrated with scirrhus cancer having the ordinary characters, that is, thick and abruptly terminated towards the duodenum and tailing off in the stomach. The muscular coat was greatly hypertrophied. It was the anterior and under surfaces of the pylorus that were affected, and the interior of the stomach corresponding presented a broad, white, depressed cicatrix with more or less irregular outline, as if there had been an ulcer there at some time or other. The small intestine was thickened and puckered. The cæcum was healthy, and the ascending colon thickened by growth, and there were secondary deposits in the mesenteric glands. The liver weighed fifty-four ounces and was healthy. The pancreas, supra-renal capsules, spleen and kidneys healthy, the uterus covered with lymph but otherwise healthy. The stomach was drawn up and the omentum was puckered, forming a nodular mass along the greater curvature. Occupying the hypogastric region, chiefly on the right side, was a large tumour covered with recent lymph having a yellowish look. It proved to be a cystic tumour of the right ovary, and there was a similar tumour of the left ovary the size of an orange. They were of malignant character. The lymphatic glands on the front of the spinal column were enlarged and infiltrated with secondary deposit. There were old pleuritic adhesions to the base of the left lung and a small calcareous nodule in one lung. The heart, which weighed five ounces, was healthy. See *Insp.*, 1880, No. 326.

CASE 169. *Carcinomatous ulcer of cardiac end of stomach. Secondary growths and abscess in the liver. Extreme anæmia.*—George T., æt 31, was admitted under Dr. Goodhart on September 21st, 1880, and died on October 20th. He was a railway porter who had enjoyed good health till five weeks before admission, since which time he had become ailing and anæmic. He had pain at times at the lower part of the chest and was generally short of breath. He was obliged to give up work on August 23rd. His most obvious symptom was extreme anæmia so that enquiry was made as to whether he had lost blood. This is stated not to have been the case. There was a loud systolic murmur all over the heart, especially at the base, and also a slight diastolic murmur at one time over the third right intercostal space. There was a pleuritic rub in the left axilla and round the spine of the scapula. His appetite was good and he suffered no pain after food, no vomiting or nausea. On October 2nd, the temperature rose to 103° and he experienced a protracted rigor. Afterwards the temperature was normal. On September 28th, there is a note that he vomited and on October 14th that he had a bad night and pain just below the liver. He had orthopnoea and occasionally extreme dyspnoea. The case was thought to be one of aortic disease and ulcerative endocarditis was discussed. At the autopsy the anæmia was

thought to have considerably diminished, and the heart, which weighed fourteen ounces, was normal as regards muscle and valves except that the left ventricle was thought to be rather dilated. There was no fluid in the pleura. There were phthisical relics at both apices and at the back of the left lower lobe there was a pneumonic mass about the size of a walnut. The branch of the pulmonary artery going in the direction of this mass was found to have a small quantity of ante-mortem thrombus caught on a fork, and in the opposite lung there was a good sized artery plugged by an embolus. At the cardiac end of the stomach close to the under surface of the left lobe of the liver was a deep ulcer with raised smooth edges which led into a cavity of irregular form, the edges of which showed distinct pink cancerous growth. The œsophagus had been detached and a cavity laid open in removal, so that it was not possible to make out exactly the relation of the œsophageal orifice to the cavity. By the side of the principal opening into the stomach was a second smaller one. The liver was much enlarged and contained three or four small secondary cancerous nodules white and growing. Its right lobe was hollowed out into an immense abscess cavity the size of a cocoa nut. This had a well-defined pyogenic membrane trabeculated on its interior, and between this and the liver substance beneath there appeared in some places to be a little cancerous growth. The cavity contained a large slough about one and a half inches in diameter. The cavity was not everywhere contained within the liver capsule. Its superficial aspect opened freely into a large space beneath the diaphragm, also filled with pus. The abdominal and lymphatic glands were not cancerous. The spleen weighed seventeen ounces and was pink and soft; the supra-renal capsules, kidneys, and other organs were healthy. *See Insp.*, 1880, No. 359.

CASE 170.—*Carcinoma of pyloric end of stomach. Secondary deposits in peritoneum. Gummata of testis and lymphatic glands.*—George F., æt. 60, was admitted on April 29th, 1880, and died on January 13th in the following year. Towards the end of 1878 he began to suffer from occasional attacks of vomiting after food, and this has gradually got worse. He was admitted with a lump in the epigastrium which was thought to be cancer of the pylorus but then he developed a gummatous-feeling mass in the left testis and enlarged glands in the neck, and these rapidly subsided under mercury so as almost to disappear. The stomach symptoms were alternately better and worse. He always lies in bed in an emaciated miserable condition, "and it is hard," says Dr. Goodhart, "to say why he died at the moment that he did. He was not notably much worse than he had been for some time." At the autopsy the body was much emaciated and the scalp was scarred all over. The cerebral arteries were atheromatous and it was thought that there was some wasting of the left angular gyrus. The left eye had been removed by Mr. Bader a long time ago, and the left optic nerve was markedly atrophied and conical, being not more than half the size of the right. The commissure and tracts showed no difference. There were gummatous glands in the neck and the left testis also contained a gumma. There was early pneumonia with recent pleurisy in the bases of both lungs and a small perforating ulcer in the base of the left arytenoid cartilage. The heart weighed six and a half ounces, the muscle being in a condition of brown atrophy. On opening the peritoneum it was found to be opaque-looking all over, and thick. On the

serous surface of the diaphragm were many plates of cancer, and also in each loin. The mesentery was shortened and thickened by new growth. The stomach from the pyloric ring to the left for two inches was much thickened and infiltrated by a new growth. All the coats were affected, the muscle being twice its proper thickness, the mucous and submucous tissue about the same, and the peritoneum and subperitoneal tissue about as much thickened. The mucous membrane surface was hillocky and white for some distance further, involving fully one-third of the stomach. On scraping the section very little juice was given off, but under the microscope the disease was well marked epithelial cancer, each cell having a large single nucleus. The stomach was not dilated. The liver weighed thirty-five ounces and contained one or two doubtful secondary deposits. The mesenteric glands, pancreas, spleen, supra-renal capsules and kidneys were healthy. See *Insp.*, 1881, No 17.

CASE 171. *Carcinoma of the pylorus and lesser curvature of the stomach. Secondary deposits in peritoneum.*—Richard P., æt. 47, was admitted on January 12th, 1881, and died on February 15th. He was a clerk and his father died of cancer of the stomach. He had been ill for six or seven months with "bile and acidity of the stomach." Severe symptoms set in about six weeks ago, constant vomiting, severe burning, and boring pains radiating along the left side, up the spine, and across the epigastrium. The vomit was of a coffee-ground character and the patient was much emaciated. On February 7th the stomach was much distended and peristalsis was visible. He gradually sank and died, being unconscious for the last twenty-four hours of his life. At the autopsy the body was wasted, the lungs somewhat œdematous, and the left ventricle of the heart, which weighed seven ounces, was somewhat thick. The kidneys weighed seven and a half ounces, and were rather wasted, with narrow cortex and thickened arteries. The stomach was of usual size and its walls not obviously thickened. About the lesser curvature and about the gastro-hepatic omentum there was a sprinkling of opaque, slightly raised granules of new growth. This ran a little way along the course of the obliterated umbilical vein. There was no thickening or puckering of the coats of the stomach generally. The pylorus would barely admit a finger. It showed a deep oval ulcer, with raised, slightly fungating edges from infiltration of the sub-mucous coat. "Still," says Dr. Fagge, "the appearance of cancer was so slight, that had it not been for the peritoneal granules one might have put it down for a simple ulcer." Histologically, however, it was a true carcinoma, clusters of rounded epithelioid cells, some with two large oval nuclei in an alveolar structure. The liver, gall-bladder, mesenteric glands, spleen and supra-renal capsules were all healthy. There were no secondary deposits, except those above mentioned. See *Insp.*, 1881, No. 45.

CASE 172.—*Sloughing carcinoma of pyloric half of stomach involving the liver, pancreas, and anterior abdominal wall.*—Thomas W., æt. 32, was admitted on February 9th, 1881, and died on March 12th. The patient was well until four months before admission, when he first felt discomfort after meals. He came in for this, and a hard lump was felt in the region of the stomach. He gradually sank, and at the autopsy the body was much emaciated, but except as below described the viscera were healthy. The

heart weighed eleven and a half ounces. The abdominal wall was closely adherent to the parts behind in the epigastrium, so that when reflected the stomach was laid open. The anterior wall of the stomach at this part had disappeared and was replaced by the hinder part of the abdominal wall. "There was," says Dr. Goodhart, "a truly horrible state of things in the stomach. That viscus was contracted in an hour-glass fashion on the pyloric side of its middle. The pyloric sac thus formed was entirely converted into a foul, shreddy, gangrenous mass. A portion of the left lobe of the liver, adherent to this sac, was discoloured and also in a state of putrilage. The other or cardiac sac of the stomach had about its greater curvature a serpiginous ulcer, with raised, everted, cancerous edge, and at the lesser curvature was more ulceration, in this case wanting any cancerous infiltration of its edges. Behind this was a large mass of new growth which proved to be situated in the tail of the pancreas, and on section it was firm and fleshy." A similar large mass was found in the mesentery, but there was no other affection of the glands or other structure. See *Insp.*, 1881, No. 76.

CASE 173. *Carcinoma of the cardiac orifice of the stomach extending into the portal fissure. Obstruction of the bile duct.*—William C., æt. 63, was admitted on February 18th, 1881, and died on April 3rd. About two and a half months before admission he first noticed pain after taking food. It was of a cutting character. He gradually got thinner and weaker, becoming jaundiced, and died. At the autopsy the body was much emaciated and deeply jaundiced. The stomach was much contracted at its cardiac end. The cardiac orifice was narrowed by a mass of growth which surrounded the opening and so constricted it as to render the passage of even the little finger a difficult matter. The growth bulged into the cavity of the stomach as a white mass infiltrating the coats some distance away. There appeared to be a softening cavity in front of the mass outside the stomach and behind it. The parts around were rather puckered and adherent to each other. In this way the splenic artery above the pancreas was caught and puckered up and the growth extended into the portal fissure. There was a quantity of fibrous material adherent to the portal fissure but no obstruction of the duct till quite in the transverse section of the liver, where the commencement of the common duct was compressed by a growth in its walls. The capsule of the liver was dense and the liver compressed-looking and small, much as in a case of capsulitis. It was of a dark olive green hue. The bile duct was very dilated, more so on the left side than the right. Both sides contained bile in the ducts, of a good orange colour and clear. There was a little bile in the common duct leading down into the intestine, and there were bile-coloured contents in the intestine itself. The spleen had a thickened capsule. There were no secondary deposits. The heart weighed seven ounces and was healthy. The lungs cedematous and emphysematous. See *Insp.*, 1881, No. 100.

CASE 174. *Carcinomatous ulcer of the body of the stomach and pancreas. Perforative peritonitis. Suppuration of spleen.*—James S., æt. 49, was admitted on February 8th, 1881, and died on May 20th. Pain in the upper part of the abdomen began three months ago. It was at first after food. Shortly before Christmas he had an accident with a bucket which

caused him pain in the epigastric region. At present no cause could be made out for this agonizing pain which morphia barely relieved. The pain was constant, worse at night. He could not lie on his back or on his right side, The pain ran into the left testicle and was worse after a motion. On April 19th, a pulsation was discovered in the epigastrium and a bruit, and a diagnosis of abdominal aneurysm was made. He gradually became worse and wasted. On May 18th, on attempting to get out of bed he shrieked with pain. In the afternoon he was again in great agony. He passed four ounces of blood per rectum. "On May 19th," says Dr. Fagge, "I found him lying insensible or nearly so with white, leaden lips and cheeks, apparently from the effect of internal hæmorrhage. There was no tenderness of the abdomen." At the autopsy the body was much wasted and the lungs were cedematous; the heart weighed eleven ounces. The abdominal aorta was healthy but was pressed upon by the growth behind the stomach which surrounded the hepatic artery. The peritoneum contained a considerable quantity of puriform fluid. On the anterior surface of the stomach there was an oval sloughy-looking aperture from which gastric contents and fœtid material oozed. The orifices of the stomach were free, the body of the viscus showed a very large ulcer the size of the palm of the hand spreading over both the anterior and the posterior surface. This had a thick, soft edge obviously cancerous at one part, elsewhere its edges were only slightly thickened. It nowhere resembled the ordinary chronic ulcer. Behind the ulcer a considerable mass of white cancerous growth occupied the connective tissue and glands and projected slightly into the body of the pancreas. "The growth," says Dr. Fagge, "was a common carcinoma made up of polynuclear cells and fibrous matrix." The liver weighed fifty-seven ounces and was healthy. The spleen weighed four ounces and was soft, presenting on its capsule a number of points like tubercles but softer. In its tissues were numberless minute suppurating spots. The kidneys were healthy. *See Insp.*, 1881, No. 144.

CASE 175. *Carcinoma of pylorus and duodenum. Gastro-colic fistula. Secondary deposits in glands.*—Edward C., æt. 40, was admitted under Dr. Pye-Smith on May 18th, 1881, and died on July 28th. He presented dyspeptic symptoms with abdominal tumour. Twenty-one years previously he had had syphilis, and for the last year had suffered from burning pain in the epigastrium, foul eructations, and occasional vomiting. The vomiting has lately become more frequent. He has had constipation for the last week and has vomited brownish material. There was considerable emaciation, and in the epigastrium an irregular lobulated mass of growth, over which the skin was freely movable. It descended during respiration. Pulsation is transmitted through the tumour. There are enlarged glands in the left groin. The tongue was brown and fissured, the breathing was tubular with increased vocal resonance at the right base. The urine was healthy. On May 23rd, after an enema, the dulness of the tumour was found separated from that of the liver by a band of resonance. On July 27th, at 2 a.m., he woke up complaining of a burning feeling all over, his skin being cold and clammy. He vomited freely, bringing up food but no blood. There was no hæmatemesis throughout. He died suddenly shortly afterwards. At the autopsy the body was considerably emaciated and the lungs were somewhat emphysematous with some signs of old inflammation of the left pleura. The heart weighed nine ounces

and was somewhat small. The peritoneum was free from secondary deposits but on opening the abdomen the parts in the epigastrium and right hypochondrium were found matted together, the transverse colon drawn up and adherent to the stomach, the mesenteric and portal glands all enlarged and infiltrated, and the whole surrounded by much inflammatory material so as to form a large nodulated mass the size of a foetal head. The stomach was scarcely at all dilated. The pylorus was occupied by a mass of new growth extending partly into the duodenum and partly into the stomach, being about five inches in breadth. The surface was ulcerated and covered with one or two flocculent-looking masses. Before the organ was opened the orifice would just admit the forefinger. The stomach wall, forming the floor of the new growth was at least an inch thick in parts. In the lower part was a small opening which was found to lead into a sac the size of a large walnut, full of foul brown pus and this sac in its turn opened by a smaller orifice the size of a quill into the transverse colon. Around the orifice the bowel was ulcerated over a space of two inches in diameter and its wall was infiltrated with new growth. Although there was thus a communication between the two viscera yet it was not free and most probably did not admit of mutual passage of contents. The liver was free from secondary deposits. The abdominal glands were infiltrated by new growth and they had contracted and formed a large mass, to which also the pyloric end of the stomach and the transverse colon were adherent, and in the middle of which was the pancreas. The suprarenals and spleen were healthy, one of the kidneys contained a small scar. *See Insp.*, 1881, No. 232.

CASE 176. *Carcinoma of body of stomach invading the liver. Secondary deposits in peritoneum and glands. Peritonitis.*—Sarah S., æt. 77, was admitted on August 31st, 1881, and died on October 20th. She was admitted for œdema of the legs. There were obscure abdominal symptoms suggesting the idea of malignant growth affecting the bowels. She suffered occasionally from epigastric pain. At the autopsy there was general matting together of the abdominal organs with collections of gelatinous and puriform lymph between them at various parts, especially in the pelvis. The starting point of the disease was obviously in the neighbourhood of the stomach and liver, which organs were firmly matted together. After removal the orifices of the stomach were found to be free but the greater part of the surface was occupied by a large growth with fungating edges. This invaded directly the left lobe of the liver as a large rounded tuber. There were some glands affected and some peritoneal nodules of growth. *See Insp.*, 1881, No. 325.

CASE 177.—*Carcinoma of pyloric end of stomach. Secondary deposits in liver and lymphatic glands. Old syphilis.*—John D., æt. 46, was admitted under Dr. Pye-Smith in December, 1881, with epigastric symptoms, from which a month later he died. The patient had suffered from occasional vomiting for the twelve months preceding admission. The vomit occurred two hours after taking food. No tumour could be felt in the abdomen but the vomiting continued obstinately. He died gradually exhausted. At nineteen years of age the patient contracted syphilis, and at the autopsy there was a fibrous condition of the testes together with syphilitic necrosis of the skull. The pyloric third of the stomach formed a contracted tube

with greatly thickened walls, so as to make a considerable tumour. The stomach when slit open showed the pyloric two inches thickened to the extent of half an inch, with a firm, white, gelatinous-looking growth. The gastric surface was smooth and grey looking, and bordered towards the healthy mucous membrane by a festooned edge, at all parts a little everted but the lower part occupied by a soft fungating growth. The remainder of the stomach was thick from hypertrophy of its muscular coat but it was not dilated and was now nearly empty. The lymphatics along the upper border of the pancreas were nodulated by new growth, the pancreas itself being quite healthy, or perhaps somewhat atrophied. The liver contained small miliary grains of cancer. The spleen, supra-renal capsules and kidneys were healthy. The heart weighed nine and a half ounces. There were old adhesions of the pleura and an adhesion of the diaphragm to the right lobe of the liver. There was some atheroma of the sinuses of Valsalva. See *Insp.*, 1882, No. 4.

CASE 178. *Carcinomatous ulcer on anterior wall of stomach. Perforation. Acute peritonitis.*—William B., æt. 39, was admitted under Dr. Wilks on January 24th, 1882, and died on February 15th. About seven years previously the patient began to suffer pain in the stomach and vomited a good deal of blood. He has had occasional similar attacks since. He was admitted for persistent vomiting which occurred two hours after food, and the abdomen was found to be much enlarged and bulging. The vomit had the character of coffee-ground material. Two days before his death he was attacked with severe pain in the stomach and vomiting. The pulse was 136 and small. He afterwards rallied somewhat but died early in the morning of the 15th, the skin being bathed in perspiration. At the autopsy acute general peritonitis was found with much lymph and sour fluid from the stomach, giving the viscera a sodden look. An aperture in the anterior wall of the stomach was found about as large as a pin's head. This organ was rather large and rather thick-walled towards the pylorus, its coats being decidedly hypertrophied. About an inch and a half from the pylorus was a large ulcer, four inches in diameter with a very thick, rounded, raised margin, this being due to infiltration of the submucous tissue with a white, firm material. Some glands outside the stomach below the greater curvature were enlarged and infiltrated with a similar deposit. The liver and spleen were healthy. The lungs were emphysematous and cedematous. The heart weighed eleven ounces and the kidneys, which weighed eleven ounces, were pale and the cortex considerably wasted. See *Insp.*, 1882, No. 48.

CASE 179.—*Carcinomatous ulcer of pyloric end of stomach invading the pancreas. Secondary deposits in liver.*—George C., æt. 33, was admitted under Dr. Moxon on May 3rd, 1882, and died on May 15th. He was suffering from frequent vomiting, associated with the presence of an abdominal tumour. He had been a free drinker and had suffered from indigestion for a long time. Eight months ago he experienced a burning sensation in the stomach after food and was occasionally sick. On admission the vomiting is described as constant and the vomited matter was offensive and acid in character. It was free from blood but contained numerous bacteria. There was a hard tumour to be felt under the abdominal wall. The bowels were confined.

He was fed with nutrient enemata but gradually sank ten days after admission from exhaustion. At the autopsy the body was found to be extremely emaciated and there was a good deal of adhesion between the liver and abdominal wall and stomach. The adhesions were some of them due to the fibrous material and some to nodules of cancer which extended as white fleshy plates from the walls of the stomach, under the peritoneum, the omentum and the parts around. The pylorus was tightly strictured, and just inside, one inch from the ring, there was a deep cancerous ulcer running round the stomach. When the stomach was laid open the ulcer appeared as a deep trench extending backward upon the pancreas, one-third of an inch broad and quite half an inch deep. Its floor was smooth, but on section was found formed of cancerous material, white and firm. The interior of the stomach for fully half of its area was bossy from infiltration of its mucous membrane by growth. The œsophagus was dilated and thickened over its last two inches and superficially ulcerated. The liver weighed ninety ounces and its anterior edge was firmly adherent to the stomach. The gall-bladder was closely contracted and surrounded by firm fibrous material. The liver was full of rounded white fleshy umbilicated masses of all sizes, the centres of many being caseous. The hepatic ducts were normal; the pancreas was infiltrated in the floor of the ulcer, but elsewhere it was quite healthy. The mesenteric and lumbar glands were healthy, the spleen and supra-renal capsules healthy. The growth in the stomach and that in the liver were examined in the fresh state microscopically, the stomach scrapings gave a hyaline fibroid matrix, with small corpuscles in crowds. The liver nodules were composed of round and epithelial-type cells, many of them degenerating. *See Insp.*, 1882, No. 140.

CASE 180. *Carcinoma of the stomach invading the liver.*—The case of a patient admitted under Dr. Fagge into Philip ward and upon whom an autopsy was performed on June 9th, 1882. Dr. Fagge in his clinical account of the case says that chronic diarrhœa, wasting and ataxy were the only symptoms. He had no vomiting but could take but very little food. At the autopsy the viscera were generally healthy except that the kidneys were somewhat wasted and the heart showed marked brown induration. The stomach was adherent to the under surface of the liver. It contained an enormous cancerous ulcer with shaggy, soft, fungating edges the base of which was formed of cancer growing straight into the tissue of the liver. There were no secondary nodules. *See Insp.*, 1882, No. 160.

CASE 181. *Carcinoma of pylorus causing fatal hæmatemesis.*—Edward McG., æt. 61, was admitted under Dr. Fagge in a semi-delirious and incoherent condition. He had been ill for about two months before admission and a fortnight after admission he died, having five days before his death brought up two pints of blood. At the autopsy the body was not extremely emaciated nor was the heart wasted. The lungs were œdematous. At the pylorus was an ulcer with thick, raised, fungating edges about the size of a crown piece. Its floor was puckered and drawn in and had granular cancerous growth in it which also projected in small nodules on the serous surface. A little distance off, embedded in the subserous tissue

of the anterior surface of the stomach was a hard, tough, fibrous nodule the size of a small pea. "I think," says Dr. Fagge, "it was undoubtedly an accidental fibroma." There were no secondary growths either in the glands or in the viscera. The kidneys were somewhat wasted. *See Insp.*, 1882, No. 175.

CASE 182. *Carcinomatous ulcer at pyloric end of stomach. Death from strangulated hernia.*—The case of a male patient whose name is not given. admitted under Mr. Symonds in 1882, for a strangulated femoral hernia for the relief of which herniotomy was performed. He lived five days after the operation, having in the interval passed wind but no motion. As regards the gastric condition there was a history of vomiting for the last eighteen months and the breath and vomited matter was said to have been peculiarly offensive. At the autopsy the intestine below the seat of constriction was found collapsed, whilst above it was considerably distended. There was early pneumonia at the base of the right lung and a small ulcer on the right vocal cord. There was no peritonitis. About half an inch from the pylorus was a ring of cancerous ulceration surrounding the stomach. It was slightly puckered at the centre and had thick fungating edges. The peritoneal aspect of the stomach was rather puckered but the disease had not as yet extended beyond the organ. The coats of the stomach behind the cancer were hypertrophied, feeling thick and leathery. There was no evidence of any pre-existing chronic ulcer. There were no secondary deposits. The liver contained several small cysts, no cysts being found in the kidneys or spleen. The heart, suprarenal capsules and spleen were healthy. *See Insp.*, 1882, No. 234.

CASE 183.—*Colloid carcinoma of posterior wall of stomach. Secondary deposits in lungs and liver.*—Joseph L., æt. 58, was admitted under Dr. Wilks for pain in the back and swelling of the ankles. He had experienced pain in the left side for four months, which gradually increased, and afterwards a lump appeared in the abdomen. At the autopsy the stomach was found to be occupied by a growth which forms Preparation 681, and is thus described: "A stomach, the front of which has been removed to show above the middle of its posterior wall a rounded mass three inches in diameter at its thickest part and projecting one inch above the surrounding mucous membrane. The edges of the growth are well defined; its surface is ulcerated and has a gelatinous appearance somewhat resembling boiled sago grains. On the reverse of the specimen the growth is seen projecting beneath the serous coat, and there is an enlarged gland in the greater omentum. Histologically the growth is a cylindrical-celled carcinoma, in which many of the cells have undergone colloid degeneration." The colon, which formed Preparation 883, was affected by ulceration, as to the cause of which Dr. Goodhart says, "I have only to add that I could not discover any plugging of the vessels, but it must be remembered that in the mass between the peritoneum hugging the aorta there was cause for some impediment in the circulation; and further, it is not improbable that the lymph streams were blocked. I could not find the receptaculum chyli, but a large, indurated mass of glands occupied about the position it should have had." The liver was small and healthy, except that it contained two small, white nodules of growth, firmer and whiter than

the colloid material. The lungs contained secondary deposits. The kidneys seemed to be good organs with adherent capsules. See *Insp.*, 1882, No. 350, and *Preps.* 326, 681, and 833.

CASE 184. *Carcinoma of pyloric end of stomach and of the omenta. Secondary deposits in peritoneum, pleura, liver, and lymphatic glands. Thrombosis of femoral vein. Pulmonary embolism.*—John C., was admitted under Dr. Fagge on November 28th, 1882, and died on January 24th, 1883. He was suffering from pain in the epigastrium. He was an engineer who had had cholera in Bombay forty-one years ago. Seven weeks ago he began to vomit after taking food. There was some pain in the epigastrium but no swelling. On the 10th of December a well-defined mass was detected in the epigastrium and the right hypochondriac region. The umbilicus was elevated and composed of small round infiltrated nodules. Some affection of the umbilicus was noticed three months ago. On December 21st he felt something sticking in his throat, and upon removal it was found to be a fungoid-looking mass. The vomit contained several similar masses. The patient was losing flesh. January 10th, great pain and inability to move the left leg. 13th, fainting fits and loss of sensation in hands and feet. Partial loss of motion. 16th, nodulated mass beneath the ensiform cartilage noted; and recurrence of fits. The patient gradually became weaker and died on the 23rd very suddenly. At the autopsy there was a good deal of emaciation of the body, and there was a nodular growth at the umbilicus measuring one by three-quarters of an inch. There was a considerable quantity of fluid in the left pleural sac, and the right pleura was slightly adherent at the base. There were secondary deposits in the pleuræ but none in the lungs, the base of the left lung being compressed by effusion. There was a copious growth of cancerous nodules on the upper surface of the diaphragm on the right side. There was no secondary deposit in the mediastinal glands. The heart weighed four ounces, and the muscle showed a considerable degree of fatty degeneration. There was an embolus in the right branch of the pulmonary artery and a thrombus in the left femoral vein. The peritoneum showed small white nodules slightly raised, none larger than a quarter of an inch in length. The growth was most abundant in the great omentum, which was shrunken, and formed a mass of growth binding together the spleen and stomach, and embedding the former. The lesser omentum was also occupied by growth extending into the portal fissure. Four inches of the pyloric end of the stomach were firm and rigid. On opening it a growth was found below the mucous membrane and internal to the muscular coat. The pylorus itself was perfectly rigid from growth, and the opening was about the size of a number twelve catheter. The growth had travelled along the greater omentum to the spleen, which was embedded in it but not invaded. The duodenum was normal, as was also the whole length of the intestine, large and small, except the vermiform appendix, which was about the size and shape of a semiflexed little finger, its lumen entirely obliterated. It was packed with growth which appeared to be confined to its mucous and submucous tissue. The muscular coat was unaffected. The growth in the liver had extended up the lesser omentum into the portal fissure, but did not go along the portal canals into the liver. There were two or three large masses of cancer in each lobe and several smaller nodules; some were in the centre of the lobes, others on the surface, the latter not

umbilicated. On section the growth was vascular and alveolated, and softer than the primary growth. The large main mass was attached to and surrounded the main branch of the right hepatic duct, but the duct itself was not invaded. There were a large number of glands invaded by growth, and several of the glands behind the stomach and the duodenum, and in the lumbar region were also affected. The liver was soft and fatty. Between the rectum and bladder was a mass of cancerous glands immediately beneath the peritoneum. The pouch of the peritoneum between the rectum and bladder was thickly covered with cancerous nodules. The testes were normal. The means by which the growth had reached the umbilicus was found to be by a continuous chain of nodules along the obliterated umbilical vein from the liver to the umbilicus. There was also a chain of nodules starting upwards from the bladder in the course of the obliterated hypogastric artery. It had not quite reached the umbilicus. See *Insp.*, 1883, No. 34.

CASE 195. *Carcinoma of the pyloric end of the stomach, probably originating in a simple ulcer. Secondary deposits in liver, lymphatic glands and peritoneum. Fatal hæmatemesis.*—James B., æt. 50, was admitted under Dr. Wilks on April 20th, 1883, and died on May 8th. On admission there was an abdominal tumour which had been noticed for four months. Nine months before admission he had suffered from severe griping pain in the abdomen, and two months before admission, vomiting came on. In the epigastrium was a large, hard tumour. Vomiting was of frequent occurrence. On the 29th of April a mitral systolic bruit was heard. On May 6th, tympanites came on, much relieved by eructation. On the 8th, the patient had an attack of hæmatemesis and died prostrate. At the autopsy, he had grey hair and was much emaciated. There were old adhesions at the right base, the lungs a little emphysematous, and old adhesions over the right ventricle and at the apex of the heart. The peritoneum presented a sodden appearance and contained a good deal of turbid fluid and some lymph. Over the stomach and neighbouring part the surface was granular, apparently from extension of cancer of the stomach. The stomach was considerably dilated and its pyloric third formed a large mass about five or six inches in diameter. On opening the stomach this proved to be a dilated pyloric segment, much thickened by a soft, granular, carcinomatous infiltration. The wall of the stomach at this part was one inch thick. The edges of the disease in the mucous membrane were large, everted, fungoid masses of growth. The dilated part showed on the lower border of the stomach several secondary pouches, produced, apparently, by some softening of the cancerous infiltration, but on the upper margin of the stomach, the floor of the stomach showed a different state. It was there indurated and there was a thin, conical depression with bevelled-off edges exactly like those of an old chronic ulcer. In two angles of this depression were deep perforating sloughs and at one part was an open vessel of small size. "I could not," says Dr. Goodhart, "trace any arteries into it but it was no doubt a branch of the gastric." The glands surrounding the pylorus were all infiltrated. The pancreas was small but otherwise healthy. The liver had only one mass in it which measured an inch and a half in diameter, soft, necrotic, and situated in the hepatic tissue immediately over the portal fissure to the left of the gall-bladder. Some branches of the portal vein were plugged round it. The main vessels and

ducts were all healthy. The spleen was anæmic, the supra-renal capsules healthy. There were no gall-stones, and the kidneys were healthy but contained a few cysts. Under the microscope the growth was a columnar epithelioma which Dr. Goodhart regarded as rapidly growing, from the presence of alveoli filled with large spheroidal cells. *See Insp.*, 1883, No. 167.

CASE 186. *Carcinoma of pyloric end of the stomach adhering to the transverse colon. Exploratory laparotomy.*—Eliza S., æt. 42, was admitted under Dr. Mahomed, on June 8th, 1883, and died on July 7th. She was suffering with pain in the epigastrium after food, and vomiting, these symptoms having been present for six months. On admission she was found to be much emaciated and a hard mass was felt in the umbilical region, tender on pressure. Vomiting was almost constant and constipation was considerable. There was no jaundice. Mr. Symonds considered the growth to be in the omentum. An exploratory operation was performed on the 25th, but the growth was found to be too large and matted by adhesions to admit of removal. Pain and vomiting continued till her death about a month after admission. At the autopsy the portal vein was found to contain a large ante-mortem clot extending from its origin in the liver. There was no peritonitis. The lower end of the mucous membrane of the œsophagus was eroded, and the stomach was extremely dilated with the long axis vertical, the whole organ being on the left side of the abdomen. There was a considerable length of jejunum between the liver and stomach. Growing from the lower part of the pylorus was a malignant growth forming a tumour the size of a small orange, but this did not diminish the size of the orifice, and presented a ragged, internal surface of about four square inches. The contents of the stomach were brownish. The growth was adherent to the transverse colon, but the latter was not infiltrated by it, and looked, on being cut open, quite healthy. The growth was adherent to the abdominal wall in front of it, as was the omentum. At the lower part of the mass there was between it and the abdominal wall an abscess cavity the size of a filbert, containing stringy pus, which communicated with the exterior through a smooth fistulous opening in the laparotomy wound. The rest of the viscera, so far as examined, were healthy. The heart was small. *See Insp.*, 1883, No. 235.

CASE 187. *Carcinoma of lesser curvature and posterior wall of stomach. Secondary deposits in liver and lung. Pneumonia.*—Richard S., æt. 69, was admitted under Dr. Moxon, on September 25th, 1883, and died on October 6th. The patient had been a soldier for twenty-one years, and had led a sedentary life for the last thirty years. He was a moderate drinker. He had noticed a swelling in his abdomen for the three and a half months preceding his admission, and for the last six weeks the pain from which he had previously suffered had become worse. Motions tape-like. On admission there was moderate jaundice with great enlargement of the liver, and the patient was extremely emaciated. At the autopsy there was some evidence of old osteoarthritis and the thyroid gland was remarkably atrophied, each lobe weighing about a drachm. There was recent pleurisy of the right pleura, and the corresponding lung contained one small, pea-sized nodule of cancer. There was a good deal of hypostatic broncho-pneumonia in the left lung. The

heart weighed nine and half ounces, and the kidneys were slightly granular. The stomach appeared quite healthy on the outside, but on opening it a large, flat, carcinomatous ulcer was found on the posterior wall and lesser curvature, measuring about three inches in diameter. The edges of the ulcer were quite soft, creamy on section, and microscopically the growth was a columnar carcinoma. Around the main growth were several small nodules in many other parts of the gastric mucous membrane. The liver weighed one hundred and seventy-one ounces, a great portion of it being converted into cancerous nodules. There were no secondary deposits in the glands. The spleen weighed three and half ounces and was healthy. See *Insp.*, 1883, No. 349.

CASE 188. *Carcinoma of pyloric end of stomach and duodenum. Secondary deposits in glands.*—Elizabeth H., æt. 48, was admitted under Dr. Mahomed, on October 28th, 1883, and died on February 11th, 1884. Dr. Mahomed remarks:—"This patient had been under my observation for many months. She had a tumour situated a little above the umbilicus, and extending rather towards the left. It was about three inches long, lobulated, and not tender when manipulated. She suffered a good deal of abdominal pain, and was wasted and anæmic. I could not satisfy myself that it was a growth at the pylorus, and thought that it invaded the stomach too extensively, if it was stomach, to allow of its removal. This, however, was often discussed, and might have been carried out." At the autopsy the body was considerably wasted, the patient having originally been plump. The lungs were cedematous, and the left lower lobe almost consolidated by hypostatic pneumonia. The tumour formed by the pyloric extremity and adjacent parts of the stomach was situated just where it was felt and described during life, about the region of the umbilicus, a little above it, and extending towards the left. The œsophagus presented several patches of membranous inflammation. At the pyloric extremity of the stomach, extending a quarter of an inch into the duodenum, and nearly four inches into the stomach, was a growth involving nearly the whole circumference. It consisted of creamy-white deposit, which chiefly invaded the mucous and submucous coats, and was in many places half an inch thick. In some places, especially on the anterior wall, it invaded the muscular coat and passed through it, being visible below the peritoneum. On the mucous surface there was no actual abrasion of the mucous membrane, which seemed stretched over the growth, its deeper part being involved. There were many boss-like elevations on the surface of the mucous membrane. The lumen of the pyloric opening was not obliterated, and would admit the little finger. It was rigid and firm from the surrounding growth. About the centre there was a good deal of puckering of the adjacent great omentum. There was one very small gland affected in the gastro-hepatic omentum, and one gland about the size of a marble, closely connected with the head of the pancreas from which it was with difficulty separated. There were no other secondary deposits in the liver or elsewhere. The kidneys were normal and the heart also. See *Insp.*, 1894, No. 45.

CASE 189. *Carcinoma of pyloric end and lesser curvature of the stomach. Secondary deposits in liver and lymphatic glands.*—Charles B., æt. 50, was admitted under Dr. Pavy and died on February 15th, 1884. No clinical account of the case is preserved. At the autopsy there was a considerable

amount of purulent peritonitis, the surface of the stomach and liver being coated with lymph. The anterior wall of the stomach was adherent to the under surface of the left lobe of the liver and the pylorus was thus fixed beneath the left lobe. The stomach itself when opened was found to be occupied by a growth which, starting at the pylorus, invaded the whole of the lesser curvature and extended for about three and a half inches along the greater curvature, thus encircling the organ. The edges of the growth were much raised. At the cardiac extremity of the stomach the growth came in contact with the glands around the orifice and had affected them, and had travelled down the chain of glands beside the abdominal aorta and the crura of the diaphragm. The duodenal orifice would just admit one finger and the stomach itself, which was dilated, contained a considerable quantity of semi-liquid, digested food. The intestines were normal and there were no other secondary deposits besides those mentioned except three or four nodules, none larger than chestnuts, in the liver. The spleen was rather soft and normal. *See Insp.*, 1884, No. 50.

CASE 190. *Carcinoma of the lesser curvature of the stomach. Scar of simple ulcer. Secondary deposit in lymphatic glands.* Jane W., æt. 61, was admitted under Dr. Moxon on February 8th, 1884, and died on February 19th. She had œdema of the lower extremities and other signs of morbus cordis, from which ten days later she died. At the autopsy the heart was hypertrophied and dilated, and the mitral valve was somewhat constricted. The stomach presented a carcinoma beginning at the lesser curvature immediately to the left of the pylorus and extending around the stomach at the pyloric end, and for three inches along the lesser curvature. The mucous membrane was ulcerated but not deeper than the extent of the membrane. An inch and a-half from the pylorus was what appeared to be the cicatrix of a former simple ulcer, situated in the midst of a newly-formed tissue, but evidently involved in it by its spread from the pyloric end. There were secondary deposits in the lumbar and mesenteric glands. *See Insp.*, 1884, No. 59.

CASE 191. *Carcinoma of pyloric end of stomach invading the colon. Gastro-colic fistula.*—John L., æt. 47, was admitted under Dr. Pavy on April 25th, 1884, and died on May 2nd. Fifteen months before admission the patient vomited blood and since then he has had vomiting after food, sometimes immediately food was taken, sometimes two or three hours later. The vomiting is preceded by intense pain in the stomach. He is generally constipated but for the last month has had severe diarrhœa. There has been no blood in the motions, which were of a light, pea-soup colour and offensive smell. No tumour could be felt. He was greatly emaciated and at the autopsy the heart was found to weigh six and a half ounces, the lungs being perfectly normal. There was no recent peritonitis but there were adhesions between the transverse colon and the stomach. The pyloric two-thirds of the stomach were converted into a large, cancerous ulcer. The surface was white in colour and on section it was very irregular and nodular, and the walls were thickened by a milky, soft, new growth chiefly affecting the mucous membrane and scarcely involving the muscular coat, except at the point in the greater curvature where it was adherent to the colon. At this point the two viscera communicated by a circular orifice an inch and a half in diameter.

The gastric side of the opening was irregular and thickened but on the colic side was smooth, but with a ring of new growth around the orifice. The growth does not appear to have spread at all in the colon. The pyloric opening was not diminished by the growth, indeed it was hardly affected by it, the growth having extended up to the opening, but the mucous membrane actually forming the orifice was free from growth. There was blood in the duodenum. There were no secondary deposits. *See Insp.*, 1884, No. 147.

CASE 192. *Carcinoma of pyloric end of stomach probably arising in a simple ulcer. Secondary deposits in liver and lymphatic glands.*—James B., æt. 52, was admitted under Dr. Goodhart on March 25th, and died on August 12th, 1885. He was admitted for epigastric pain, general wasting and anæmia. His father is stated to have died from tumour of the stomach. At the age of 34 the patient had a hard chancre. He has been a temperate man. His illness began with pain in the back. His bowels were regular and there was no pain, or blood, on defæcation. Subsequently the pain altered in character and became gnawing, accompanied with tightness around the abdomen. On admission he had pain in the back and epigastrium with great anæmia, wasting and occasional vomiting, bringing up a considerable quantity of blood. The liver dulness extended to the costal margin. The urine was free from albumen. Five or six times the patient was sick during April, the pain in the back being very severe and persistent. On May 5th, coffee-ground vomit. On July 21st, the above signs and symptoms continued and the abdomen was retracted except for the epigastrium where the wall is rigid and a distinct resistant mass can be felt. The patient rapidly went downhill, suffering the most intense agony until he died on August 12th. At the autopsy the body was extremely emaciated and the lungs were emphysematous. The branches of the pulmonary artery in the lungs were thickened. The heart and kidneys were small. The pylorus was drawn up and adherent to the under surface of the liver. The portal glands were cancerous and the whole matted together with the pylorus to form a mass the size of a large orange. The stomach was not dilated; its walls were thickened. On opening up the stomach a large ulcer, with hard everted edges, measuring three inches in the longitudinal diameter of the pylorus and four inches transversely was found occupying the pylorus and contiguous part of the stomach. In fact the parts when undivided would form a globular sac, which would contain a large orange, extending up towards the liver. It is to be noticed that where it touched the liver it was separated off by a simple, fibrous capsule, and the liver was not invaded by continuity, looking as though the ulcer had first been simple and had then become malignant. The liver weighed forty-six ounces and contained five or six secondary nodules of the size of damsons or hazel-nuts. Some on the surface were umbilicated and some were situated in the substance. The glands in the portal fissure were cancerous and had obstructed the cystic duct so that the gall-bladder contained colourless mucus. The veins were healthy; the ducts otherwise patent; the mesenteric and lumbar glands were healthy; the spleen weighed four and a half ounces, and was firm.—*See Insp.*, 1885, No. 240.

CASE 193.—*Carcinoma of pyloric end of stomach adhering to liver and pancreas. Enterostomy.*—Charles H., was admitted under Dr. Carrington on

September 30th, 1884, and died on November 4th. The patient was admitted with symptoms of carcinoma of the stomach, for which on October 25th Mr. Golding-Bird performed enterostomy. It was the original intention, if possible, to remove the whole diseased area by Billroth's operation, but it was found not to be possible. The small intestine was therefore opened high up instead. "The post-mortem," says Dr. Goodhart, "confirmed the opinion that it would have been quite impossible to remove the entire disease. I will add an opinion, that when the disease forms a visible and distinctly palpable external lump removal will but seldom be possible." The patient did well after the operation for some time, in fact till November 3rd, when he was clumsily fed and the food was passed into the peritoneum. He was seized with intense pain and never rallied. At the autopsy it was found that the enterostomy opening was situated just at the commencement of the jejunum, and that the nozzle of the tube had been passed, not into the bowel, but had been poked through into the peritoneum behind the stomach. There was evidence of recent peritonitis. The lungs were both of them exceedingly emphysematous, and there was a small abscess at the upper part of the left lung with surrounding consolidation looking like a softening infarct. The heart weighed eight and a-half ounces, and was brown, with œdema of the pericardium. The pyloric third of the stomach was occupied by a growth which on the mucous aspect fungated out into the mucous membrane half way towards the cardia in flat button-shaped excrescences, and towards the pyloric region showed an internal surface of firm, white, bossy elevations, which caused great destruction to what at first was thought to be the pylorus. It was, however, an inch or more on the cardiac side of the pylorus. The pylorus itself was about natural as regards size, but on its duodenal aspect were large, soft, fungating excrescences. The coats at the affected parts were half an inch thick and were firm, white, and creamy looking. The upper growth was adherent to the under surface of the left lobe of the liver and had just commenced to invade it by direct extension, the capsule line having disappeared. The growth was also adherent to the head of the pancreas but that viscus did not appear to be involved. There were no secondary deposits. The growth was examined histologically in 1891, and found to be a spheroidal-celled carcinoma. *See Insp.*, 1885, No. 346.

CASE 194. *Carcinomatous infiltration of the whole stomach. Secondary deposits in omentum and lymphatic glands. Ascites.*—Joseph R., æt. 57; was admitted on November 4th, 1885, under Dr. Pye-Smith for swelling of the abdomen and vomiting. Five days before coming into the hospital the patient is said to have vomited about a quart of clotted blood. After this there was severe pain in the right hypochondrium which was increased by taking food. Vomiting followed food. The abdomen began to swell five weeks ago. Emaciation has been progressive from the first. On admission the abdomen was considerably distended with fluid. Vomiting followed immediately upon the ingestion of food. The vomit consisted of white fluid mucus. November 7th, patient has taken a little fish and has not been sick for two days. Sickness, however, returned. On November 9th, paracentesis abdominis was performed and fourteen and a half pints of ascitic fluid were drawn off. November 12th, diarrhœa. November 16th, has taken food better. Less nausea. November 29th, very weak and emaciated. November 30th, patient died. At the autopsy there were old organised adhesions on the right side of

the chest and the lungs were cedematous but contained no secondary deposits. The heart was small. The great omentum, which was puckered up into the upper part of the abdomen contained some small, secondary nodules the size of an almond; but besides this the peritoneum was free from growth. The cavity, however, contained a large amount of clear, yellow serum. The liver was about two-thirds of its normal size, soft and flabby, and on section the lobulation was ill-marked. There was no secondary growth either in the liver or mesenteric or lumbar glands. The spleen weighed two and a half ounces, being small, and the kidneys were healthy. The stomach forms Preparation 702, and is thus described:—"A contracted stomach measuring eight inches along its greater curvature and two and a half inches transversely at its widest part. The walls of the organ are universally thickened, in some places to the extent of half an inch, by infiltration of growth in the submucous tissue and by hypertrophy of the muscular coat. The lining of the stomach is slightly ulcerated and externally there are numerous adhesions to the neighbouring structures. Histologically all the coats of the organ are seen to be infiltrated by a growth having the characters of a spheroidal-celled carcinoma." The walls of the œsophagus were thickened to quite double their normal state. But the œsophageal orifice was perfectly healthy, and even the stomach at this part for quite half an inch. The wall of the intestine was very thin and in parts was described as almost transparent. See *Insp.*, 1885, No. 385, and *Trans. Path. Soc.* vol. 37, p. 236.

CASE 195. *Carcinoma of the pylorus. Ascites and pleuritic effusion. Fatty degeneration of myocardium.*—George S., æt. 45, was admitted under Dr. Pavy on November 6th, 1885, and died on March 22nd, 1886. About the beginning of 1885 he began to complain of swelling and pain in the epigastrium which have been getting more severe. On admission there is epigastric pain not increased by taking food, with slight cedema of the legs and conjunctivæ. The fingers are clubbed. A tumour can be felt in the epigastrium measuring four inches by two and half inches, which is pulsatile, and a bruit can be obtained by pressure with the stethoscope. There is a soft, systolic murmur in the second left space. In December the patient is worse, and looks worn and has more pain. For the last few nights has vomited the contents of the stomach a few hours after food. January, vomiting comes on occasionally, but does not appear to be associated with food recently taken. February, getting weaker; March 22nd (the day of his death), for the past ten days the patient has been getting much worse, and for the last three has been placed under morphia. At the autopsy the hair was white and the body was much emaciated. There was some slight cedema of the ankles. The pleural cavity contained rather more than a pint of clear yellow serum, and both lungs were compressed. There were no secondary deposits in the bronchial or mediastinal glands. The heart weighed eleven and half ounces, and was free from valvular disease, but the interior showed well-marked tabby-striation of the muscle. The abdominal cavity was full of clear yellow serum, and the pylorus was occupied by a large mass of cancerous growth which, when the stomach was opened up, measured six and half inches vertically, and two and half inches from the duodenum towards the stomach. The wall of the stomach at the affected part was about an inch in thickness. The growth ceased abruptly towards the duodenum.

Its edge was thick, nodulated and everted. The stomach was not dilated. The intestines were normal, except for some sodden and œdematous condition. The liver was free from secondary deposits and the glands also. The spleen weighed six ounces, and was quite firm, "like the spleen of heart-disease." The kidneys were pale, but otherwise healthy. See *Insp.*, 1886, No. 105.

CASE 196. *Carcinoma of the pylorus and greater curvature of the stomach. Fibroid disease of myocardium. Anasarca.*—John G., æt. 62, was admitted under Dr. Moxon on June 16th and died on July 29th, 1886. He had formerly been a sailor and was now a cook. He had suffered from yellow fever and rheumatism; and from indigestion for some years. Last winter he had a cough which has persisted. Two months ago he became troubled with shortness of breath which has increased. Dropsy began three weeks ago. Has wasted greatly during the last two months. On admission the pulse was very irregular and there was a slight systolic bruit to be heard over the heart. The urine was normal. The chest gave signs of bronchitis. The dyspnoea and irregularity of the pulse increased and the œdema extended up the legs to the genitals. He complained at times of pain after food. No vomiting. On July 13th he vomited brown fluid. Pain in the epigastrium. He got weaker and died. At the autopsy there was general anasarca of the lower extremities, genitals, back, hands and forearms. There was about a pint of fluid on either side of the chest, and old pleuritic adhesions over the upper parts of both lungs, with calcareous and fibroid nodules. The heart weighed fourteen ounces and was large and flabby, and the muscle of the left ventricle together with the endocardium showed very extreme fibroid change. There was a large, cancerous ulcer commencing at the pylorus and extending backwards towards the greater curvature of the stomach. It formed an ulcerated area three by two and a quarter inches. The edges were raised, sinuous, indurated and typically rolled, while the floor was composed of growth which was ulcerating and shreddy on the surface. The greatest depth of the growth was only three quarters of an inch. On section it was white, soft and juicy. The great omentum was adherent to the stomach opposite the site of the growth. The pancreas was healthy and there were no secondary deposits to be found anywhere. The kidneys also appeared to be normal except for some thickening of the vessels and the presence of several large cysts. The prostate was hypertrophied. The testes were healthy. See *Insp.*, 1886, No. 255.

CASE 197. *Carcinoma of pylorus and omentum. Chronic peritonitis, causing intestinal obstruction. Secondary deposits in liver and lymphatic glands.*—John M., æt. 58, was admitted under Dr. Carrington, on August 18th, 1886, and died the same day after the operation of right lumbar colotomy for the relief of symptoms of intestinal obstruction. Ten weeks before admission the patient gradually began to suffer from loss of appetite, nausea and constipation with occasional vomiting. Six weeks ago, pain in the stomach, swelling of the abdomen, and pain on defæcation. The motions were thin and tape-like. For the last eight days, frequent vomiting. On admission the patient appeared moribund with a pulse of 120, foul breath, dry, brown tongue, and several hard masses could be felt in the abdomen, one just below the umbilicus, and the other in the left iliac region. A band could also be felt stretching across the right side of the rectum one and half inches from

the anus. Right lumbar colotomy was immediately performed, but the patient never rallied. At the autopsy there was a considerable degree of hypostatic pneumonia of the left lower lobe, and to a less degree on the right side. The peritoneum contained four pints of fluid, and there was a little recent lymph in it. The whole of the peritoneum was very considerably thickened, and in parts drawn into bands. The omentum formed a thick, contracted mass of malignant disease, yellowish on section. A band proceeding from it was attached to the spleen, and another passed to the right inguinal canal, and was lost in the cord about two inches down. Neither of these seemed to cause any intestinal obstruction. They were both of old date. The stomach was much contracted with thick walls, and the pylorus was affected by malignant growth continuous with that in the omentum. This was slight, but there was enormous hypertrophy of the muscular coat of the pylorus. The small intestine was normal, but the rest of the intestinal tract was hypertrophied in its muscular coat, and its surface was opaque from chronic peritonitis. The liver contained several distinct typical nodules of malignant growth, white and umbilicated, and there was much malignant growth in the mesenteric and lumbar glands. The kidneys were quite healthy. It should be added that the demonstrator who made this autopsy does not appear to have been convinced that the primary growth was in the stomach, but it seems to have been a contracting, infiltrating carcinoma with chronic peritonitis and numerous bands of adhesion. See *Insp.*, 1886, No. 283.

CASE 198. *Carcinomatous stenosis of the pylorus. Secondary deposits in lymphatic glands. Thrombosis of femoral vein. Acute lobar pneumonia.*—Sarah G., æt. 56, was admitted under Dr. Pye-Smith on September 15th and died on November 1st, 1886. She came in with epigastric pain and sickness. Two movable nodules were felt in the epigastric region. There was abdominal distension, but it was uncertain whether this was due to gastric or intestinal swelling. There was an inconstant, systolic, apical bruit. She suffered very little from sickness while in the hospital. Œdema of the left leg came on. On October 30th the temperature rose to 103° and the left chest became dull with bronchial breathing. On the following day she died, and at the autopsy the whole of the left lower lobe was in a condition of pneumonic consolidation. The external iliac on the left side, and the upper part of the femoral vein were filled with thrombus. On opening the abdomen the nodules felt during life were at once recognized, the larger and more prominent being a gland as big as a large walnut, situated just below the pylorus, and the other nodule being the pylorus itself infiltrated by growth. The stomach was very contracted, and its walls uniformly and greatly thickened. This thickness was increased towards the pyloric end by the infiltration with growth. This was strictly limited to the pyloric end extending into the stomach for a distance varying from two inches to half an inch. It presented a very clearly-defined edge. Distally it stopped absolutely at the pylorus. It was impossible to get the little finger through the pylorus so great was the constriction. The liver weighed twenty-three ounces and was wasted, but was free from secondary deposits. The gall-bladder was shrunken, containing no bile but an oval gall-stone three-quarters of an inch by half an inch in size. The pancreas was normal. The lumbar glands were not affected. The spleen weighed four ounces and was healthy. The supra-renal capsules and kidneys were also healthy. See *Insp.*, 1886, No. 379.

CASE 199. *Carcinomatous ulceration of pylorus. Adhesion to and infiltration of liver. Secondary deposits in lymphatic glands.*—Eliza P., æt. 50, was admitted under Dr. Goodhart on March 2nd and died on April 19, 1887. Sixteen months ago the patient experienced severe pain in the left iliac fossa. She lost strength and was admitted into Clinical ward in April, 1886. A painful lump was then felt on the left side below the last rib. She left the hospital in June and since that time has gradually gone downhill suffering frequently from vomiting and abdominal pain. On admission for the second time she was emaciated and continually vomited. A lump was felt in the epigastrium. She gradually got weaker and died; and at the autopsy the body was very much emaciated and the lungs were œdematous. There was a growth at the pyloric end of the stomach measuring about two inches in length and encircling the orifice. It was limited by a well-defined margin on the duodenal side of the pylorus and did not extend into that part of the alimentary canal. On the other side it was limited by a ragged, everted margin. The surface was ulcerated. It extended through the muscular layer of the stomach and at the upper part through the peritoneum, which was adherent to the edge of the liver. It also infiltrated slightly the adjacent portion of the liver. The pylorus admitted the thumb. The stomach was not dilated. The glands in the portal fissure were infiltrated with growth. The liver was healthy and the ducts patent. The gall-bladder, pancreas, mesenteric and lumbar glands, spleen, supra-renal capsules and kidneys were all healthy. See *Insp.*, 1887, No. 98.

CASE 200. *Sarcoma of stomach. Malignant peritonitis.*—Louisa B., æt. 38, was admitted under Dr. Goodhart on April 22nd, 1887, and died on May 3rd. Her illness began four weeks before with pain and swelling in the abdomen. After admission the swelling diminished and the patient suffered from diarrhoea and vomiting. A trace of albumen was noticed in the urine. The patient died fourteen days after admission. The peritoneal cavity was found to be almost obliterated by adhesions, the small intestine being matted together into a ball, as is seen in chronic peritonitis. No growth was found between the coils of intestine and liver; the mesentery looked healthy save for a few enlarged glands. The large intestine was firmly adherent to the stomach and the passage was especially small at the hepatic flexure of colon. The uterus, ovaries and tubes were normal, though adherent to adjacent structures. The viscera affected by the main disease form Museum Preparation No. 719, thus described: "A stomach from which a portion of the anterior wall has been removed to shew a rounded mass of growth about the size of a pigeon's egg, projecting from the posterior wall an inch and a half from the pylorus. Around this mass the walls of the stomach are thickened and infiltrated by growth. The area thus affected extends from the pyloric ring along the lesser curvature to the œsophageal opening, and for six inches along the greater curvature, and is separated by a well-defined margin from the healthy parts beyond. Externally there is a considerable deposit of growth embedded in which is seen the colon closely adherent to the stomach. Histologically the growth is a sarcoma with rounded and spindle cells." See *Insp.*, 1887, No. 116.

CASE 201. *Carcinoma of the pylorus and lesser curvature of the stomach. Secondary deposits in liver and lymphatic glands. Healed phthisis. Ovarian*

cysts.—Eliza S., æt. 58, was admitted on August 10th, for weakness vomiting, and œdema of the legs, and died on August 27th, 1887. The patient's mother died of cancer. A year ago the patient began to suffer from bronchitis, and three months ago her legs became œdematous, and she had difficulty in passing her motions. At this time, too, vomiting came on. On admission the patient was very weak and anæmic. A hard lump, not very movable, was felt in the left hypochondriac and epigastric regions. Another lump was felt midway between the umbilicus and pubes. There was a systolic, apical bruit. On August 13th, the pulse was weak and occasionally intermittent. On the 23rd, the patient was very weak, with pain in the bowels and diarrhœa. On the 26th, she rapidly sank and died. At the autopsy the left lobe of the thyroid was cystic. There were old adhesions at both apices with some old fibroid change at the tops of both lungs. There were no secondary deposits in the thorax, but there were some caseous mediastinal glands. The heart weighed nine ounces, and was free from valvular disease. The kidneys weighed five ounces, and were small, but appeared to be healthy. There were two multilocular ovarian cysts, one as big as a baby's head, the other rather smaller. They had long, readily-twisted pedicles. On the lesser curvature of the stomach, rather anterior than posterior, and with its centre about an inch from the pylorus, the upper part of which it involved, was a hard mass the size of a Tangerine orange. The peritoneum over it was puckered, while on the inner surface there was extensive ulceration. The growth was firm on section and evidently ascirrhous carcinoma. Some lymphatic glands in the neighbourhood were infiltrated, but the bile-ducts and structures of the portal fissure did not seem to be obstructed. The stomach was not dilated. The liver weighed thirty-five ounces, and was pale and soft, and contained numerous, small (size of pea) secondary nodules, chiefly on the surface. No lardaceous change. No gall-stones. Pancreas normal. Spleen seven ounces, and healthy. *See Insp.*, 1887, No. 277.

CASE 202. *Carcinomatous ulceration of the pylorus. Numerous secondary deposits in liver and some in glands of portal fissure. Hæmorrhagic ascites. Portal thrombosis*.—George H., æt. 59, was admitted under Dr. Wooldridge on August 20th, and died on September 24th, 1887. His prominent symptom was vomiting after food. Two months ago he noticed a lump to the left of the umbilicus. Bowels regular. On admission, the patient was emaciated with a distended abdomen. Several small painful nodules could be felt. September 8th, abdomen very tense. September 20th, bile in the urine. The patient became drowsy and died in a condition of cholæmic coma. At the autopsy there was a trace of œdema in the legs and the body was much emaciated. There was also some œdema of the lungs. There was a little diffuse atheroma of the aorta but the heart and kidneys were normal. The peritoneal cavity contained four pints of blood-stained ascitic fluid; not much clot. The blood staining was due to a mass of growth in the liver which had fungated through the capsule. The veins of the œsophagus were slightly dilated and the stomach was somewhat dilated also. The pylorus was almost surrounded by a soft mass of growth which was sharply defined towards the duodenum, into which it did not extend. Towards the stomach it extended irregularly, at one part extending more than one inch but elsewhere only half an inch. The middle

of the growth had ulcerated away but the margins were projecting an eighth of an inch. On section the growth was one eighth to one quarter of an inch thick and mostly occupied the mucous membrane, but there were two minute nodules infiltrating the muscle. The growth did not constrict the pylorus. The liver showed masses of growth, one to two inches in diameter, which were white in colour but often blood-stained, of varying consistence, some firmish, but the majority quite soft. One had fungated through the capsule and projected as a bleeding mass. On section both lobes were mainly occupied by growth. The portal vein and its branches to the right lobe were occupied by dark, soft, partly decolorized clots which were adherent. Some were post-mortem, but there were recent ante-mortem also. There was growth in the glands surrounding and pressing upon the vein. The inferior vena cava near the liver had a partial thrombus adherent to one side of the vein, but the channel was only slightly obstructed. There was a little lymph with some small irregular nodules of growth in the recto-vesical pouch. There was no growth in the mesenteric or lumbar glands. See *Insp.*, 1887, No. 311.

CASE 203. *Carcinoma of stomach, secondary to chronic ulcer of the lesser curvature. Secondary growth in omenta, mesentery, liver, abdominal, thoracic and supra-clavicular lymphatic glands. Thrombosis of veins.*—Maria C., æt. 45, was admitted under Mr. Bryant on April 10th, and died on April 26th, 1888. For three years she had suffered from pain on defæcation and blood in the motions, and for three months she had experienced pain in her stomach; two months ago an attack of jaundice came on and three weeks before admission the abdomen became distended, the motions passed being small and mixed with bloody mucus. On admission a rectal stricture was felt an inch and a half from the anus and the glands of the neck were enlarged. On the 23rd jaundice was increasing and on the 26th she died suddenly while talking to another patient. A diagnosis was made of malignant disease of the rectum with secondary cancer in the liver. At the autopsy the body was exceedingly stout and there was some œdema of the left upper arm. There was also stenosis of the rectum with a fibroid and ulcerated condition of the mucous membrane thought to be due to syphilis. There was no malignant growth in the rectum. The peritoneum generally was healthy and not invaded by growth, and there was no ascites. Over the upper surface of the gastro-hepatic omentum there was, however, some local inflammation, and the omentum formed a prism of growth over an inch thick adjacent to the stomach and extending from end to end. No growth in the great omentum, which was adherent to the left ovary. The mesentery formed a dense mass of solid growth an inch thick. The mass of growth in the mesentery and in the gastro-hepatic omentum and in the glands around the aorta weighed over six pounds. The growth surrounded but did not invade the coats of the aorta and vena cava. The stomach was rather small. On the upper surface, along the lesser curvature, one and a half inches from the pylorus, was a chronic ulcer, one inch by three-quarters of an inch in diameter, and not above a sixteenth of an inch deep. The edges were not fungating nor raised and were not spreading. There were three small, submucous nodules of secondary growth. The wall of the stomach in the pyloric region was much thickened, especially in the muscular coat. In places there was thickening of the rugæ of the

mucous coat, but there was no ulceration. The floor of the ulcer was formed by the mass of growth in the gastro-hepatic omentum. The thickness of the wall was an eighth to one quarter of an inch, and there was no sharp limit at the pylorus although the thickening did not extend far along the duodenum. The rest of the alimentary canal was healthy except the rectum as above described. There was growth in the transverse fissure of the liver forming a mass from which a dense, thick gall-bladder projected. On section the gall-bladder contained green mucus to the amount of about half an ounce. The gall-duct was embedded in growth but not completely obstructed. The duct was patent near the duodenum and was bile-stained. The liver weighed fifty-eight ounces, and contained growth which invaded it along the track of Glisson's capsule. Under the microscope Dr. Pitt remarks:—"The liver is a beautiful specimen showing nodules of growth the cells of which have become colloid, and there is extensive proliferation, with increase of bile-ducts in the portal canals." Examination of the gastric ulcer microscopically showed carcinomatous infiltration of the muscle and connective tissue. There were some places healthy, and there were some places where the growth had undergone a colloid change. There was thrombosis of the left innominate vein and the inferior vena cava. There was an embolus and thrombosis in the left lung. There was a mass of glands infiltrated with cancer and matted together above the left sterno-clavicular joint and others round the left innominate vein, and there was growth spreading along the anterior surface of the pericardium above. The heart weighed eight ounces. The kidneys weighed eleven ounces, and had dilated pelvis from pressure of growth upon the ureter. Dr. Pitt says:—"I conclude from the microscopical and other appearances that the growth had commenced in the floor of a gastric ulcer." See *Insp.*, 1888, No. 135.

CASE 204. *Carcinomatous infiltration of the stomach. Numerous secondary deposits in glands, connective tissue and skin.*—Jane F., æt. 53, was admitted under Dr. Pye-Smith on April 25th, and died on May 16th, 1888. On admission the skin over the abdomen was covered with nodules about the size of a pea. Bowels constipated. The patient often vomits, the vomited matter being sometimes black and sometimes yellow. A mass of hard nodules was felt on the left hand side at the root of the neck. There were enlarged glands in the right axilla and the liver was felt half an inch below the ribs. The abdomen was distended. A hard nodular tumour was felt just above the umbilicus to the left of the median line; tender upon pressure. Pain referred to epigastrium over the region of the tumour. Harsh cough and sputum tinged with blood. After admission the patient vomited occasionally but not very frequently. No hæmatemesis. She died by asthenia, and at the autopsy the body was of a sallow colour and weighed about six and a half stone. The lower lobe of the left lung was tough and brownish and the glands in the mediastinum were enlarged and hard from secondary deposits which, however, remained limited to the glands and did not involve the surrounding tissue. The heart weighed eight ounces. The aorta was extremely atheromatous. The inferior cava was pressed upon by growth around it and its wall was invaded in two places, small nodules of growth appearing in its interior. The peritoneum was covered with small nodules of malignant deposit and contained four pints twelve ounces of fluid. The stomach was very much

contracted in all diameters. Externally it appeared to be almost one mass of growth, a small portion of the wall at the cardiac end of the greater curvature alone being free. On opening it the internal surface was seen to be irregular. Over the lesser curvature where the growth was thickest there was extensive ulceration. Towards the greater curvature and pylorus the mucous membrane was raised in hard nodules; but towards the cardiac end a small portion was thin, soft and healthy. The growth had apparently commenced near the centre of the lesser curvature, spreading through the walls of the stomach upwards and downwards. At the pyloric extremity it stopped in a well-defined broad line, but it extended as two nodules about an inch and a half into the œsophagus. The tip of the left lobe of the liver was adherent to the stomach and invaded by growth; but the liver otherwise was free from deposit. The gall-bladder was full but there was no obstruction to the flow of bile from it. The pancreas was healthy. There was a large mass of growth in the mesentery, continuous with the growth in the lumbar glands. The aorta and vena cava were encased in one mass of growth which spread forwards into the mesentery, and surrounded the pancreas and the splenic vessels. The aorta was not invaded and could be easily dissected out. The spleen was healthy, the peritoneum over it showing several nodules. The intestines and kidneys were healthy. There was a cyst in the left ovary. "Microscopically," Dr. Pitt reports, "the stomach showed an encephaloid carcinoma. There were columns and masses of cancer cells embedded in alveolar or fibrous tissue. The cells were spheroidal and not cylindrical." See *Insp.*, 1888, No. 164.

CASE 205. *Carcinomatous ulcer of the cardiac end of the stomach and œsophagus. Secondary growths in the liver.*—Edward B., æt. 60, was admitted under Dr. Goodhart, on March 7th, and died on June 9th, 1888. He was admitted with pain in the abdomen, and some indefinite hardness at the epigastric angle. On the 9th, the liver was felt. On the 29th, severe pain, the swelling reaching nearly to the umbilicus. On April 5th, the tumour now reaches below the umbilicus. A good deal of pain in the swelling, which increased greatly in size. The patient became much feebler, and a week or so before death had some vomiting, which passed off in a day or two. At the autopsy the body was very thin, weighing one hundred and eleven pounds. The lungs and heart were healthy. At the cardiac end of the greater curvature of the stomach was a large, nearly circular ulcer measuring about three inches across. Its edge was rounded, and almost uniform. It was not nodular. The base of the ulcer also was of uniform thickness. It had completely replaced the mucous membrane, and presented a white smooth surface on the peritoneal side, there being no peritonitis and no nodules. The growth just invaded the œsophagus. The liver weighed about twelve pounds, and on its upper surface were seen several whitish-yellow, prominent, rounded masses which were soft and not umbilicated. On section the viscus showed very little healthy substance. The greater part was invaded by growth, which was mottled and granular, of a yellowish-white colour, everywhere soft, breaking down more readily than normal hepatic tissue. The report of microscopical examination by Mr. Targett is as follows:—Microscopical examination showed that the growth was a medullary, glandular carcinoma of the stomach. The type was a large, round alveolus lined with well-marked

columnar epithelium, and filled with glandular epithelial cells of varying size and shape. The columnar cells were shorter than those of carcinoma of the rectum and nowhere formed a complete lining to the alveolus. They seemed merely to represent the origin of the carcinoma from the acini of the gastric tubules. Nowhere did the alveoli present a hollow centre; they were always filled with cells. In the liver growths the cells were rapidly degenerating. The kidneys were granular, and the cortex somewhat wasted. There were no secondary deposits in the mesenteric or lumbar glands. See *Insp.*, 1888, No. 194.

CASE 206. *Carcinomatous infiltration of the greater part of the stomach. Widely disseminated secondary deposits. Thrombosis of iliac veins.*—Job S., æt. 38, was admitted under Dr. Goodhart on January 25th and died on July 13th, 1888. The patient had had dyspeptic symptoms for the last six months. Occasional sickness. On admission anæmia was the important feature. On January 30th he vomited six times in the night and a swelling was noted to the left of the umbilicus. On March 7th there was cedema of the right leg and thigh. Latterly there has been frequent vomiting, very foul in character. A hard tumour was felt connected with the left lobe of the liver. Cedema of both lower limbs and abdominal wall. Death by exhaustion. Even to the end the nature of the case was not very clear. At the autopsy the body was much emaciated and there was dropsy of both legs and of the abdominal wall. Secondary deposits were found in the liver, peritoneum, pleura, lung, mesenteric glands, kidneys, supra-renal, sternum and skull. There was thrombosis of the vena cava and of the iliacs. The pleura contained a few secondary nodules of growth on the right diaphragmatic surface. The lower lobe of the right lung was adherent to the diaphragm by secondary deposits. The heart weighed eleven ounces and was healthy, and the kidneys were also healthy except for one secondary deposit. Both external iliac veins were filled with clot and in the right vein there was a growth in the interior which had spread in from the glands. The clot extended some distance up the vena cava but did not fill it. The peritoneum showed a general infection of secondary deposits of growth as small, hard nodules the size of a pea to a hazel nut. There was a little ascites. The stomach presented an enormous cancerous growth involving the whole of the pyloric half of the viscus. On laying open the stomach along its convex margin the growth was found to involve both anterior and posterior surfaces and to extend to the pylorus. It formed two plate-like masses with raised, overhanging edges and its free surface was extensively ulcerated. The serous surface of the stomach was covered with growth and the omenta and mesentery were matted with deposit. The masses of growth on the surface of the stomach were the size of the palm of the hand. The liver weighed eighty-four ounces and contained one huge mass of growth in the left lobe and a few small nodules. They were white and firm on section. The gall-bladder was affected with growth on its serous surface, the interior being healthy. The growth was spreading along the round ligament of the liver. The mesenteric glands were extensively invaded and both supra-renal capsules contained secondary deposits. The spleen weighed six ounces and was normal. The stomach forms Preparation 683 in the museum, and is thus described:—"A stomach, the whole of which except a small portion at the cardiac end is thickened and infiltrated by new growth. The organ has been

laid open along its greater curvature and shows, projecting from its mucous surface, an ulcerated mass which occupies the middle third of the viscus save for a narrow tract corresponding with the lesser curvature. A section through the walls of the stomach shows that the growth has extended through the mucous to the serous coat which is nodulated and thickened. Histologically the growth is a cylindrical-celled carcinoma." See *Insp.*, 1888, No. 234.

CASE 207. *Carcinoma of the pylorus, apparently secondary to chronic ulcer. Secondary deposits in lymphatic glands.*—Elizabeth R., æt. 65, was admitted under Dr. Pavy on June 11th and died on July 16th, 1888. She was admitted for dyspepsia, vomiting and weakness. For the last few weeks there has been severe pain in the epigastrium after food, relieved by vomiting. On admission, the patient was wasted and a small tumour could be felt in the epigastrium. There was constant vomiting after food. On July 13th she was much exhausted by the repeated vomiting, and the tumour appeared to be enlarging. She gradually sank and at the autopsy the body was much wasted and the heart weighed six and a-half ounces. There was some emphysema of the upper lobe of the right lung, but these organs were otherwise healthy. The oesophagus was normal. There was a thickening of the pyloric extremity of the stomach commencing at the pylorus and extending for about one and a-half inches. The mucous surface was thickened and white. In the middle of this thickened area was a deep narrow ulcer, with chronic edges, not at all like ulcerating growth. This was apparently a chronic gastric ulcer which had become malignant, for the thickening of the mucous membrane is of that nature. The pylorus must have been a good deal obstructed and the muscular coat was much hypertrophied. On the serous surface there were nodules of growth along the lesser curvature and the glands about the common bile-duct and in the mesentery were affected. The liver was healthy. The gall-bladder contained small calculi. The spleen, mesentery, supra-renal capsules and kidneys were healthy. The spleen weighed one and a-half ounces. The uterus contained a small polypus and the os was stenosed. Mr. Targett's microscopical examination of the growth is as follows:—"The base of the ulcer showed much fibrous tissue mixed with muscular coat, and running among it were lines and groups of small spherical cells which were evidently cancerous. The edge showed the mucous membrane raised by growth in the submucous tissue, and there were even small alveoli of epithelial cells among the gastric tubules just above the muscularis mucosæ. The enlarged glands along the lesser curvature showed that the growth was a scirrhus carcinoma. In the description of the naked-eye specimen the appearance suggested a chronic ulcer becoming malignant from its well-defined outline, hard edge and smooth, clean, hard base. I examined a great number of sections in order to test this point, but the conclusion arrived at was that it could not be settled by mere histological examination in the absence of clinical evidence of bygone gastric ulcer. The points supporting the view are the immense amount of fibrous tissue as compared with epithelial cells in the base of the ulcer, and its smooth clean surface, quite unlike ulcerated growths." See *Insp.*, 1888, No. 242.

CASE 208. *Carcinomatous stenosis of pylorus. Secondary deposits in peritoneum and skin. Thrombosis of pulmonary, left iliac and prostatic veins.*—George H., æt. 48, was admitted under Dr. Goodhart on July 26th, and died

on August 17th, 1888. His prominent symptoms were vomiting and dyspepsia. For one year he had suffered from pain in the back and constant vomiting, together with abdominal pain and wasting. On admission nodules were felt on the surface of the abdomen, and the stomach was dilated. August 7th: he was fed with cream and whey, and the stomach was washed out. He gradually sank and died exhausted. At the autopsy the lungs were cedematous. There was thrombosis of several medium-sized vessels on both sides of the lungs. The clots were decolorized and slightly adherent, but not breaking down. "It is remarkable," says Dr. Pitt, "that with such clots there should have been no evidence of pulmonary infarcts." The heart weighed seven ounces, and was healthy. The aorta was slightly atheromatous. The peritoneum presented numerous small nodules of growth scattered over it generally. On opening the abdomen a large mass of growth was readily palpable just below the liver. It surrounded the pylorus and the pancreas. The growth had commenced at the pylorus or near it. A ring of growth, sharply defined on the duodenal surface and extending as a mass half an inch thick for one inch along the gastric wall, had caused stenosis, the orifice just admitting the finger tip. There was no ulceration of the surface. The growth had also extended as a thin sheet along the submucous tissue for about three inches irregularly, and beyond this were many minute, discrete, small plaques visible on the surface. At one spot on the lesser curvature there was a depressed area which looked as if due to an old ulcer which had healed. The growth surrounded the pancreas which was hardly anywhere invaded, but throughout was encased in a dense mass of white growth. The appearance of the growth was the same everywhere. The growth surrounded the duct leading to the left lobe of the liver, but it was patent. The gall-bladder was distended with dark, greenish, viscid bile. The liver weighed forty-eight ounces, and was healthy. There were no secondary deposits in the mesenteric or lumbar glands. The portal vein was contracted, but not completely obstructed. The stomach was very dilated, and contained three pints of fluid looking like beef-tea. The kidneys were healthy except for a few cysts. There was thrombosis of the veins of the prostatic plexus, the thrombus being of recent date. Three subcutaneous nodules of growth were noticed in the abdomen. Microscopical examination by Dr. Pitt is as follows:—"The stomach growth was microscopically an encephaloid carcinoma. The alveolar spaces were filled with large, deeply-stained cells. Some gland tubes were much elongated. The growth had invaded the muscular coat, and in places the serous coat, which latter was much thickened." See *Insp.*, 1888, No. 279.

CASE 209. *Diffuse Carcinoma of the stomach. Healed simple ulcer. Secondary deposit in peritoneum and pleura. Stricture of intestine.*—Robert H., æt. 44, was admitted under Dr. Hale-White and died on October 13th, 1888. At the autopsy the body was much emaciated, especially as regards the face. The limbs were fairly well nourished. The thorax contained a considerable quantity of fluid, six pints being measured out, but a good deal of this gravitated from the abdomen. Eleven pints besides were measured from the abdomen. The lungs were cedematous. The left lung at its base showed large areas of blood extravasation. The pulmonary artery, both the main trunk and all the major branches, were filled with a coiled clot. Part of

the clot was folded. The clot was regarded as an embolus from some large venous trunk. The heart was normal. No veins were found diseased. The origin of the clot could not be determined,—probably from the iliac veins. The stomach was extensively infiltrated with growth, chiefly along its sub-mucous coat. The muscle for two inches from the pylorus was a third to half an inch thick from hypertrophy, and for two or three inches more was a quarter of an inch thick. The one and a half inches next the pylorus was free from growth. The submucous tissue after this began to be infiltrated with an opaque white growth and was a sixteenth of an inch thick, and this extended over almost the whole of the stomach. The cavity was contracted, measuring only two inches from above downwards, and about the normal five inches transversely. The mucous membrane on the posterior wall was thrown into rugæ, but that of the anterior was smooth. On the smaller curvature, two inches from the pylorus was a large, depressed scar of an old ulcer. The serous coat was mostly free but on the lesser curvature and spreading to each side of the stomach were flat plaques of growth. The mesogastrium and meso-colon were infiltrated with dense growth, and formed rigid white masses. Numerous nodules smaller than peas dotted the surface of the intestines. The mesentery was densely dotted with tiny nodules along the lymphatics. The colon was much more affected than the small intestine, and the growth was most marked along its attachment, where in places it had infiltrated the muscular wall. A ring of growth had circumscribed the serous surface of the ileo-cæcal valve, and had left a constriction which only admitted the small finger. A similar constriction surrounded a spot on the transverse colon. Although the colon was more or less firmly fixed throughout, it was almost empty and showed no signs of obstruction anywhere. The appendix cæci was thick, and infiltrated with growth on the serous surface. The left ureter was surrounded and its outer parts infiltrated with growth. The mucous membrane was not affected. The pelvis of the left kidney was dilated and contained two or three ounces of urine. The kidneys were examined microscopically and gave evidence of ascending nephritis. The microscopical examination of the growth showed it to be a carcinoma medullare. See *Insp.*, 1888, No. 352.

CASE 210. *Carcinomatous stenosis of pylorus. Secondary deposits in peritoneum. Fatty degeneration of myocardium.*—Emma. J., æt. 42, was admitted under Dr. Goodhart on February 28th and died on April 1st, 1889. The patient had rheumatism at the age of eighteen. Last June she first felt pain about two hours after taking food. After five or six weeks she began to vomit, usually once daily, and this has continued up to the present time. On admission the patient was thin, weighing six stone, whilst a year ago she weighed twelve stone. There was a firm mass to be felt an inch above the umbilicus of the size of a small orange; succussion in the stomach and visible contraction after manipulation. Chest barrel-shaped. She continued to vomit daily and had much pain referred to the sternum. She became very feeble with fainting attacks. She died on April 1st. Sarcinæ were found in the vomit. At the autopsy the body was emaciated, there was no ascites and no scars. The pleuræ were normal. There were numerous hæmorrhages in the lung about the size of peas and the smaller bronchi contained gastric contents. There was considerable emphysema with cedema, and a small calcareous nodule at the lower border of the right upper lobe behind. On the

lower border of the left upper lobe in front was a small oval nodule, white and rather translucent, which microscopically was a fibroma. The heart weighed seven and a half ounces and there was a little cedema of the visceral pericardium. The valves and coronary arteries were healthy, but on microscopical examination both the right and left ventricle showed extreme fatty degeneration. There were no fibroid patches. Over the growth in the stomach the peritoneum was puckered, and the mesentery at the upper part of the intestine showed a small secondary nodule of growth which on microscopical examination proved to be a cylindrical carcinoma resembling the growth in the stomach. The intestines were normal, both large and small. The pylorus was surrounded by a hard ring of growth not extending into the duodenum and about two inches broad. The opening was narrowed and would just admit the little finger, but there was little or no ulceration. The growth was firm and white and was chiefly in the submucosa though even to the naked eye it was invading the muscular tissue. Still the muscle was everywhere discernible. Microscopically the growth was a cylindrical carcinoma with alveoli lined by short columnar epithelium and having in parts a considerable amount of stroma. Elsewhere the alveoli were very large and filled with spheroidal cells, thus destroying the definite tubular arrangement. The gall-bladder was quite full but the bile flowed easily from it into the duodenum. There were no enlarged glands in the portal fissure. The liver weighed thirty-seven ounces and was normal to the naked eye and under the microscope. There were no secondary deposits in the glands. The spleen weighed three ounces and was firm and normal. The supra-renal capsules were normal. The kidneys weighed nine ounces and contained a few cysts, but were practically healthy organs. The os uteri was patulous and there was an erosion of the cervix. *See Insp.*, 1889, No. 124.

CASE 211. *Carcinoma of the pyloric end of the stomach invading the liver. Secondary deposits in liver, lung, peritoneum, and mediastinal and abdominal lymphatic glands.*—George M., æt. 56, was admitted under Dr. Wooldridge on February 6th, and died on May 12th, 1889. His chief symptom was vomiting, and there was a hard lump in the epigastrium. His appetite had been failing for two years, and for twelve months he had suffered from epigastric pains. Vomiting three months. Sick at once after taking food. A hard irregular swelling in the epigastrium tender on pressure. Also on the left side a hard edge seemingly continuous with the left lobe of the liver. Death by asthenia, vomiting not being severe and no definite signs of dilatation of the stomach. At the autopsy the body was emaciated, and at the pyloric end of the stomach was an ulcerating growth limited by the pylorus and surrounding the stomach to the breadth of about five inches. Its edges were raised and overhanging, and close to the pylorus the ulceration was extensive, the floor of the ulcer being formed by the left lobe of the liver, to which the stomach was adherent. The mass of the growth lay below the left lobe of the liver and roughly parallel to it at about an inch and a half below its edge. The rest of the stomach was not dilated and the finger could be pretty easily passed into the duodenum from the stomach. The glands about the head of the pancreas and in the portal fissure were invaded by growth, but the common bile-duct was not pressed upon. Microscopically the growth in the stomach and in the secondary deposits proved to be a cylindrical carcinoma (malignant adenoma

of the stomach). The liver weighed thirty-four ounces and contained a secondary deposit in its right lobe as big as a Tangerine orange. There were secondary deposits in the lumbar and mesenteric gland, but the pancreas, though surrounded by infiltrated glands, was not involved. The spleen weighed two and three-quarter ounces. The kidneys were slightly cirrhotic, and the right supra-renal capsule contained a small secondary deposit. There was also a secondary deposit in the right lung and the mediastinal glands were loaded with growth. The pericardium was normal except for slight œdema, and the heart weighed six ounces. *See Insp.*, 1889, No. 178.

CASE 212. *Carcinoma of lesser curvature and cardiac orifice of stomach extending into œsophagus. Secondary deposits in liver and lymphatic glands.*—Joseph T., æt. 55, was admitted under Dr. Perry on July 26th, and died on October 14th, 1889. The patient had suffered from epigastric pain for three weeks, which has been worse since last August, at which time a lump was noticed in the epigastrium. Occasional hæmatemesis. He has been unable to swallow solid food since February. Lately the food has caused pain. After admission the stomach was washed out daily, with relief, but the patient gradually became weaker. Towards the end there was œdema of the abdominal walls and the legs. At the autopsy the body was very thin and the heart weighed six ounces. There were about two pints of serum on either side of the chest, and the bases of the lungs were carnified. The pericardium contained two ounces of fluid. On opening the abdomen the stomach lay beneath the ribs, and to it the transverse colon was adherent. The stomach was small and distorted, and the growth, which occupied a large area in the stomach, formed a definite tumour when the colon was pushed down, but did not form any mass outside. The growth was adherent to the body of the pancreas behind, and two small lymphatic glands were enlarged. On opening the stomach the mucous membrane of the œsophagus for the last inch was slightly pushed up by submucous growth, and the growth extended from the cardia along the lesser curvature to within an inch and half of the pylorus. The mucous coat was infiltrated and hypertrophied, the mucous membrane irregularly thickened and ulcerated. The pylorus and the half inch adjacent were free, but the whole of the pyloric half of the stomach was involved—two inches along the greater curvature. The cardia and pylorus were brought close together owing to the contraction that both had undergone. Under water the mucous surface was villous, thickened, flocculent and very soft. The liver contained numerous small nodules of growth, varying in size from a milliary tubercle to a pea, and necrotic. The gall-bladder was not distended. The spleen weighed three and half ounces, and was healthy. The supra-renal capsules and the abdominal lymphatic glands, except as above mentioned, were free from deposit. The kidneys weighed eight and a half ounces, and on microscopical examination showed some diffuse, interstitial inflammation, but not of any great importance. *See Insp.*, 1889, No. 387.

CASE 213. *Carcinomatous infiltration and contraction of the stomach. Secondary deposits in lymphatic glands.*—A man, æt. 77, whose chief symptoms were pain after food, and vomiting associated with progressive emaciation. A tumour was felt at the epigastric region nine months before

his death. At the autopsy the viscera with the exception of the stomach were found to be normal. The stomach is preserved in the Museum as Preparation No. 703. It is thus described: "A stomach measuring seven inches along its greater curvature and two inches transversely at its widest part. Its walls are three-eighths of an inch thick, and on section show a white deposit in the submucous tissue. The mucous membrane is smooth and free from ulceration. The omenta are puckered and contain secondary deposits in their lymphatic glands. The portion of colon adherent near the pylorus is considerably narrowed. Histologically all the coats of the organ are seen to be infiltrated by spheroidal-celled carcinoma." See *Guy's Hospital Gazette*, 1889, p. 77.

CASE 214. *Carcinoma of pyloric end of stomach. Secondary deposits in liver and lymphatic glands. Hepatic abscess communicating with stomach. Chronic peritonitis.*—James H., æt. 60, was admitted under Dr. Goodhart, on August 1st, 1889, and died on January 20th, 1890. On admission the history was that he had been wasting for twelve months with vomiting after meals. On admission he was emaciated and there was a hard tumour in the upper part of the abdomen, with a firm edge. On August 3rd the temperature was 103·6°, and during this month the tumour rapidly increased in size. On September 9th pus discharged from the umbilicus and the opening was enlarged by the surgeon. On November 4th the incisions were healed. The tumour now spread more to the left of the abdomen and was very soft. The patient gradually became weaker and at the time of death was much emaciated. The abdominal incisions had healed, one being at the umbilicus, and the other two inches to the right. The pleura was universally adherent on the right side and to the diaphragm on both sides. The heart weighed nine ounces, and there was a little atheroma of the aorta. The veins at the inferior end of the œsophagus were congested. The stomach was dilated and adherent to all adjacent viscera. The main axis was vertical owing to the pylorus lying at the level of the umbilicus. On the posterior wall near the smaller curvature there were four small openings about two inches from the pylorus and the probe passed down one of these led by a sinus two inches long into the abscess cavity in the liver. Two of the other apertures led to another portion of the growth which was breaking down and contained grumous material. A mass of soft growth sharply bounded below by the pylorus had invaded the two inches above this, occupying chiefly the mucous and sub-mucous coats. The growth was one eighth of an inch thick, ulcerating on the surface, and lines of growth could be traced in the muscular and thickened serous coats. The rest of the intestinal canal was healthy. The transverse colon, stomach, spleen and liver were matted together. The peritoneal cavity contained over two pints of rather viscid, clear fluid, containing a few flakes of lymph. The liver weighed one hundred and forty-eight ounces, and formed a large tumour which occupied the abdomen in front as low down as the umbilicus. It was infiltrated with nodules of soft growth, especially in the left lobe. These varied in diameter from a quarter of an inch up to four inches, and many were vascular and some broken down. In the right lobe was an abscess cavity oval in shape, three inches long and two across, containing odourless green pus, which communicated with the stomach by the above-mentioned apertures and probably had previously discharged through the

incision externally at the inferior margin of the liver. At the time of death however, there was no longer a track. The abscess cavity had formed in the midst of growth and was due to growth breaking down. "I was unable," says Dr. Pitt, "to find any trace of the gall-bladder in the midst of the œdematous, hypertrophied, fibrous tissue which lay in this region behind the primary pyloric growth, still I feel certain that it was not the seat of the primary growth." A few of the glands here contained growth, but there were no other glands affected in the body. The pancreas, spleen, and supra-renal capsules were healthy but surrounded by adhesions. The kidneys weighed eleven and a half ounces, and were normal. Microscopical examination showed that the growth was a spheroidal carcinoma with a moderate amount of stroma. "The interesting feature of this case," says Dr. Pitt, "is the suppurative of the malignant growth which first discharged externally from two incisions which were made, and later into the stomach when the external apertures closed." See *Insp.*, 1890, No. 30.

CASE 215. *Carcinoma of pylorus and lesser curvature of stomach. Secondary deposits in intestine.*—Alice E., æt. 42, was admitted under Dr. Taylor, for sickness and wasting, on January 4th and died on February 9th, 1890. Sickness began in 1872 but was much better till four months ago. The patient never noticed tumour, pain, hæmatemesis or melæna. On admission she was much wasted and the stomach was dilated and a lump was felt thought to be malignant disease of the pylorus. The stomach was washed out for a time but she gradually became weaker and sank collapsed on February 9th. At the autopsy there was extreme wasting and no anasarca. The lungs were pale and dry with a small patch of broncho-pneumonia at the posterior part of the mid region of the right lung. The heart weighed five ounces and was almost devoid of fat, the muscle, valves and cavities being normal. "The viscera were too matted to have allowed the pylorus to be excised, I think," says Dr. Shaw, "but it looked like a suitable case for gastro-enterostomy." There was a slightly ulcerating growth involving the pylorus and narrowing it so that a little finger could not be got into it. The growth was strictly limited to the pylorus on the duodenal side but it extended into the stomach along the lesser curvature to within two inches of the cardia. The greater curvature was hardly affected. The intestines were healthy except that scattered in the large intestine, and a little in the ileum, were flat masses of secondary deposit situated immediately beneath the mucous membrane. None of them were ulcerated and none of them involved the serous coat. The liver weighed twenty-eight ounces and was normal. There were secondary deposits in the abdominal lymphatic glands. The extreme tail of the pancreas was involved in the growth. The spleen weighed two and a half ounces and was firm. The supra-renal capsules were normal and the kidneys healthy except for a few small cysts. "The growth was histologically an ordinary rather scirrhus carcinoma, the secondary deposits in the glands and intestines showing nothing unusual." See *Insp.*, 1890, No. 58.

CASE 216. *Carcinoma of lesser curvature and cardiac orifice of the stomach. Secondary deposits in peritoneum, pleura, lungs, and mediastinal glands.*—Henry N., æt. 47, was admitted under Dr. Goodhart on April 30th, and died on May 28th, 1890. He suffered from epigastric pain directly after food since last

Christmas. No vomiting. The pain has been more severe the last three months. On April 23rd, hæmatemesis. On May 15th a mass was felt in the left hypochondrium. He gradually wasted away, and died on the 28th. At the autopsy the body was greatly emaciated, and the gastric growth had extended in patches for an inch along the lower end of the œsophagus. The middle half of the stomach was invaded with growth. No ulceration except superficially over the surface for about two inches square. The pylorus and about one inch of the adjacent wall had entirely escaped the invasion of the growth. The larger curvature was also free from growth, but the growth starting in the lesser curvature had spread to the cardia. The growth encircled the organ, and there was marked hypertrophy of the muscular wall. The rest of the intestinal tract was normal. The whole of the peritoneum was dotted with minute flat spots of secondary growth. There was no lymph or serum. The liver was normal. The heart weighed six ounces, and was very small. There was but little fat on the surface, the connective tissue being œdematous. There were minute secondary deposits very numerous in character on the pleura, "and," says Dr. Pitt, "in appearance the rest of the lungs did not show much abnormal, but on palpation the bronchi were noticed to be thickened. On slitting them up there were found to be innumerable minute flat patches of growth on the mucous surface in the larger ones. In the smaller ones the growth was limited to one side of the tube, and had grown along the lymphatic tracts; scarcely any branch had escaped." The larynx and trachea were normal. The kidneys were healthy. See *Insp.*, 1890, No. 189.

CASE 217. *Carcinomatous infiltration of the stomach. Secondary deposits in lymphatic glands. Gall-stones.*—James B., æt. 49, was admitted under Dr. Goodhart, for pain in the stomach and vomiting, on April 26th and died on June 18th, 1890. No family history of cancer. Three years ago had colic and was in Stephen-Ward for three weeks. Syphilis in 1866. Two years ago he began to feel sick and vomited once daily. This continued for a year or so. Then he had pain in the epigastric region, and for some time he has been unable to take solid food. Has got thin and weak and pale. On admission pain in the epigastric region; but no tumour can be felt. Patient extremely anæmic but not particularly wasted. He was after this troubled with constipation and had frequent vomiting. He also got more anæmic and wasted very much. A tumour made its appearance in the epigastric region. No hæmatemesis. He gradually sank and died. At first the diagnosis was doubtful, lying between pernicious anæmia and gastric ulcer, simple or malignant, but the emaciation and the presence of a tumour in the epigastrium at length led to the conclusion that he was suffering from carcinoma ventriculi. At the autopsy the body was much emaciated and there was a little old pleurisy on either side. The lungs were emphysematous. The heart weighed nine and a half ounces and was normal. There was no atheroma. A softish growth encircled the pylorus extending for some way along the mucous membrane of the stomach, mostly on the posterior surface, nearly as far as the œsophagus. It also extended above and below beyond the curvature just on to the anterior surface. The growth had an ulcerated surface at this part, the edge being raised and soft. Surface irregular, fungating, and in places the fungating masses were breaking down. Did not look vascular. Covered

with mucus. On the lower part of the anterior surface just about the middle of the greater curvature was an ulcer, nearly two inches in diameter, like the one above described but separated from it by healthy-looking mucous membrane; but on cutting through this, growth was found infiltrating the wall of the organ beneath the mucous membrane and coming through this again forming the second ulcer. The growth was thickest at and about the pylorus and formed here the tumour that could be felt through the abdominal wall. No perforation, no narrowing of the pylorus, and the stomach not dilated. There were a few enlarged glands doubtfully containing secondary deposit in the omentum. Otherwise the glands were normal. There was some old peritonitis on the upper surface of the liver causing adhesion to the diaphragm. The liver itself weighed sixty-nine ounces and was free from secondary deposit. There were a few gall-stones. The spleen weighed nine and a half ounces, and was normal. The supra-renal capsules, pancreas and kidneys normal. *See Insp.*, 1890, No. 211.

CASE 218. *Carcinomatous stenosis of pylorus with great dilatation of the stomach. Secondary deposits in the skin and supra-renal capsules, and in many lymphatic glands.*—George M., æt. 60, was admitted under Dr. Pitt, and died on June 28th, 1890. Pain in the back since Easter, vomiting after meals, the vomited matter being of a black colour. For six weeks he has noticed lumps in his skin. He had considerable pain whilst in the hospital. There was a hard flat tumour in the epigastrium with numerous secondary growths in the skin. On admission, the stomach was not dilated, but it became much so towards the end. The liver and spleen normal. Bowels confined. He remained in much the same state, never at any time being anæmic or cachectic in appearance. On the morning of his death he became cold and his heart gradually failed. At the autopsy the wasting was not extreme. There were numerous subcutaneous growths of various sizes from an eighth to half an inch in diameter. They were freely movable, and on section varied in vascularity. Some had undergone caseous changes in parts. There were numerous nodules of growth in the glands along the neck on both sides, especially on the lower part of the left side, and three glands along the œsophagus also showed growth. The lungs were normal, but there was a little emphysema. There was extensive growth in the anterior mediastinal glands. The heart weighed nine ounces and was normal. On the anterior surface of the aorta within the pericardium there were numerous minute nodules of growth. There were also some along the right auriculo-ventricular fold, and on section nodules were seen in the wall of the right ventricle and in the left ventricle. The abdominal aorta was very atheromatous, and there were glands infiltrated with growth pressing on the lower end of the œsophagus. The stomach was extremely dilated containing five pints of foul, blackish fluid. It measured eleven inches in the vertical and seven and a-half inches in the transverse direction. The pylorus was fixed in the epigastrium to the liver by growth, so that the dilatation of the stomach had placed the upper margin above the level of the third space. On opening the stomach the growth was found to be limited to the pyloric two and a-half inches of the stomach. There was much hypertrophy of the muscular coat at the pylorus, and there was also a large amount of growth in the lymphatic glands in the neighbourhood forming an irregular mass behind the stomach. The growth extended along the aortic glands down to the iliac vessels. There was a

small growth in the left supra-renal, and in the right a larger one into which hæmorrhage had taken place some time previously. Most of the growth in the glands had undergone partial caseation. There were nodules of growth on the peritoneum in the neighbourhood of the stomach, but not elsewhere. The liver weighed forty-eight ounces and was healthy in appearance. The spleen weighed four ounces and was normal. The kidneys weighed ten ounces and were tough but otherwise normal. "The microscopical examination," says Dr. Pitt, "of the growths of the skin showed tubular processes lined by cells which were rather spheroidal than columnar." See *Insp.*, 1890, No. 225.

CASE 219. *Sloughing carcinoma of the body of the stomach. Subdiaphragmatic abscess opening the pleural cavity. Secondary deposits in lymphatic glands.*—John O'H., æt. 44, was admitted under Dr. Pye-Smith, on February 26th, and died on July 12th, 1890. He came in for epigastric pain and vomiting. He had frequent pain, which improved under treatment. In March the spleen could be felt, and later a tumour in this region, which was painful. In April he had pyrexia, and in May a rigor. In June a pericardial rub was heard. The pericardium showed no signs of pericarditis, and the heart, which was small, weighed six and half ounces. In the left hypochondrium there was a stony, hard mass consisting of the growth in the stomach wall and of the spleen, extending up to the axilla as far as the sixth rib, and down nearly two inches below the ribs. This mass was densely adherent to the ribs and the diaphragm. The outer part of the growth above the spleen had sloughed, and the cavity thus formed communicated with the pleura by means of two sloughing apertures in the diaphragm. The spleen was not invaded by growth, but was large and tough, measuring about six inches in length. The inch of the stomach next the œsophagus, and the two and a half inches near the pylorus had escaped, but the rest of the wall of the stomach was infiltrated with growth more than an inch in thickness with an ulcerating surface. The growth had spread by contiguity to the aortic and other glands at the back of the stomach, forming a hard, solid mass, matted to all the adjacent parts. See *Insp.*, 1890, No. 254.

CASE 220. *Carcinoma of the pyloric end and lesser curvature of the stomach. Dilatation of the stomach. Secondary deposits in lymphatic glands. Peritoneal adhesions. Fatal syncope following washing of the stomach.*—John S., æt. 48, was admitted under Dr. Perry on August 29th, with symptoms of dilated stomach, and died on September 6th, 1890. He was a coachman who had always enjoyed good health till the previous summer, when he began to suffer from indigestion, which got well under treatment. Last spring he had a second attack. For the last ten weeks he has vomited about once a week but during the last week the vomiting has been once daily. Has never brought up blood. On admission he was wasted, and in the epigastric region there was a resonant tumour varying in size and showing peristaltic movements, evidently a dilated stomach. No lump could be made out till after the stomach was washed out, when a hard mass could be felt in the epigastrium. As he vomited twice a day his stomach was washed out on the 4th. "On the next day when I saw him," says Dr. Perry, "he seemed much pleased with the relief afforded but said that the clinical assistant had not washed his stomach out enough." On the 5th the washing was repeated with no ill

results; but on the 6th, after a mid-day washing out lasting an hour he became slightly off his head and wished to get out of bed, and about an hour after the operation was complete fell into a condition of profound collapse with almost imperceptible pulse, but apparently suffering no pain. In spite of all remedies he died at about six o'clock in the evening, never having rallied except for a little after an injection of ether. He died on the 6th, at 6.30 p.m. There was no sugar in the urine. At the autopsy the body was much emaciated and both pleuræ were adherent and the lung had to be cut out on both sides from the diaphragm. The diaphragm was adherent to the liver and spleen. The heart weighed eight ounces and there was no ante-mortem clot in the pulmonary artery or in any of its branches. The stomach showed a growth involving the pyloric end and the lesser curvature. The growth began about three quarters of an inch within the pylorus and surrounded the stomach for a distance of about an inch and a half. Along the lesser curvature the length of the growth was about three inches. The coats of the stomach were thickened and infiltrated by the malignant deposit, the thickness averaging five-eighths of an inch. The pyloric end of the stomach would, however, admit the little finger through the growth fairly easily. Near the pyloric end of the growth there was a depression on the posterior surface about three quarters of an inch transversely by half an inch. "It was thought that this might have been an old ulcer," says Dr. Perry, "but this was not so as the mucous membrane was intact, as determined by the naked eye and by the microscope, except for a small, round, shallow abrasion probably produced by the end of the tube used in washing out the stomach." There was no ulceration of the mucous membrane of the rest of the growth. Lying apparently detached from the main mass towards the cardia were a few cancerous nodules in the submucous tissue, rather smaller than peas. Externally the peritoneal coat was thickened and puckered and contained small secondary nodules. The growth was adherent to the head of the pancreas. The intestines were normal but in the mesentery were numerous small secondary deposits causing puckering. The transverse colon was drawn close up to the stomach and the great omentum was adherent to the abdominal wall. There was no recent peritonitis. The liver weighed about forty ounces. It was mostly adherent to the diaphragm and contained numerous nodules of secondary deposit. Microscopically these deposits consisted of aggregations of spheroidal cells. The liver substance was normal. The walls of the gall-bladder were much thickened but there was no ulceration of the mucous membrane. The glands of the transverse fissure of the liver were not enlarged. The pancreas normal. Some of the mesenteric glands contained small secondary deposits. The spleen weighed four ounces and was firm but free from deposit. The capsule was a good deal thickened. The organ was adherent to the diaphragm. The kidneys weighed seven and a half ounces and were normal. A section of the stomach was examined microscopically and the growth was found to be a spheroidal carcinoma with scanty stroma. *See Insp.*, 1890, No. 336.

CASE 221. *Carcinoma of the pylorus invading the pancreas. Secondary deposits in the liver. Fatal hæmatemesis.*—William G., æt. 43, was admitted under Dr. Perry and died on September 23rd, 1890. Three months ago he began to suffer pain and flatulence after food. Since then he has

wasted. Diarrhœa for the last three weeks. Urine port-wine colour. Has taken no stimulants for the last six years but before had been a free drinker of beer. He was admitted for enlarged liver and jaundice. Impulse in the fourth space internal to the nipple. Fine rales all over the right base and the left base on deep inspiration. Urine normal. Abdomen distended. Liver much enlarged and hard. Some œdema of dorsum of foot. August 27th: œdema of legs below knees. Dulness of bases of both lungs. September 22: vomited eight ounces of blood-clot with some coffee-ground material. September 23: hæmorrhage from the stomach severe and could not be arrested. He became weaker and died at 7 a.m. on the 24th. At the autopsy, he was a dark, well-built man, very thin, but not emaciated. There was œdema of both feet, ankles and legs up to the knees. Jaundice well marked. There was old pleurisy at the right apex, and a considerable amount of emphysema of the lungs with some œdema at the bases. The heart weighed eight ounces, and there was a little atheroma of the aorta. The mucous membrane of the stomach was stained with tannic acid and perchloride of iron, and the viscus itself was somewhat dilated, and its walls a little thickened. It contained twenty-one ounces of clotted blood and there was blood also in the intestines. On the posterior wall at the middle, and two inches above the greater curvature, was a flat and soft breaking-down growth about two inches in diameter, ragged in appearance. But no vessel could be seen to have ulcerated through in the patch. The pylorus would admit the tip of the index finger, and projecting into the stomach in that situation were a number of villous-like masses of very friable breaking down growth, crumbling when touched. On opening the valve it had a very ragged look, the interior being covered with soft breaking-down growth. At the pylorus there was a mass of hard growth about the size of a small orange occupying the whole of the head of the pancreas, and surrounding and constricting the pylorus, the wall being infiltrated by a hard, fibrous mass of tissue separated from the mucous membrane by translucent tissue. The liver weighed one hundred and twelve ounces, and was greatly enlarged and studded with secondary growths. The growths were most extensive in the left lobe, but not extensive in the right. The liver tissue, which was free from growth, had a nutmegged appearance. The gall-bladder was distended, not involved in the growth. Pressing on the common duct was an infiltrated gland causing narrowing but not complete occlusion of the duct. The head of the pancreas was infiltrated by growth: supra-renal capsules normal: spleen three and a half ounces, normal: kidneys seven ounces, normal. The post-mortem examination was made by Dr. Campbell. Dr. Pitt says:—"Sections of the liver showed that the growth was a carcinoma." The stroma was infiltrated with numerous small cells pointing to a rapidly growing mass. See *Insp.*, 1890, No. 353.

CASE 222. *Carcinoma of pylorus. Secondary deposits in lymphatic glands. Venous thrombosis and parotitis.*—Hannah N., æt. 46, was admitted under Dr. Goodhart, on September 19th, 1890, for abdominal pain, and died on October 3rd. For six months previously the patient noticed a lump on the left side. This gradually increased. Pain and vomiting afterwards supervened. On admission a soft, fluctuating mass was noticed in the umbilical, left lumbar, hypochondriac and epigastric region. Another mass was felt

in the left iliac region. What these masses are does not appear. The left leg became swollen on September 25th, the next day, the left parotid gland was enlarged. The patient gradually sank, and died on October 3rd. At the autopsy there was cedema of the left leg, and the left common iliac vein was occluded by thrombus, which extended just into the inferior vena cava, but did not occupy the entire lumen of that vessel. Clot was also found in the uterine veins on the left side. Both submaxillary glands were swollen, and pus exuded on section. The parotids were enlarged, but were not incised. The internal jugular veins were healthy. There was some slight adhesion at the left base, emphysema of both lungs, and a small patch of collapse at the right base. The pyloric end of the stomach was occupied by a growth about one and half inches in length, and completely surrounding the pylorus, but not greatly narrowing its orifice. The growth did not protrude into the duodenum. The surface presented a large, ulcerated area with everted edges. The walls of the stomach were thickened, but there was no dilatation. Two glands in the lesser omentum were enlarged to the size of pigeons' eggs, and were cancerous. The liver was healthy, gall-bladder, pancreas, spleen (three and a half ounces), supra-renal capsules healthy. The kidneys weighed thirteen ounces, and were pale. The uterus was enlarged, and adherent to it and springing from the left ovary was a multi-locular cyst containing about two pints of clear, viscid, yellow fluid. Histological examination of the growth by Dr. Shaw resulted in this report. "Histologically it is spheroidal-celled carcinoma with much stroma (scirrhus)." See *Insp.*, 1890, No. 372.

CASE 223. *Large carcinomatous ulcer of the stomach without gastric symptoms. Death from strangulated hernia.*—Elizabeth D., æt. 81, was admitted under Mr. Davies-Colley for a left femoral strangulated hernia. She had had a hernia for many years which had always gone back till four days before admission when it became large and painful and could not be returned. The same day vomiting came on and her bowels have not been opened since. Shortly after admission Mr. Davies-Colley operated, and in the course of the operation the gut, which was black, gave way. The opening in the gut was sutured and the bowel returned. The patient died seven hours later, and at the autopsy some fæcal material was discovered in the pelvis with recent peritonitis. The lungs were small and emphysematous. The left ventricle was enlarged, the aorta atheromatous, the gall-bladder contained one large gall-stone. The spleen and supra-renal capsules were healthy, the kidneys were granular and showed a considerable degree of interstitial nephritis under the microscope. The stomach, which forms Prep. 695, is thus described:—"A stomach laid open to show a slightly raised ulcerated growth extending from just within the pyloric ring along the lesser curvature for a distance of five inches, and affecting both walls of the organ so as almost to reach the greater curvature. The edges of the growth are raised and slightly everted, and its ulcerated surface presents numerous gelatinous-looking nodules. On the reverse of the specimen the growth is seen to project as a lobulated mass beneath the serous coat. Histologically it is a spheroidal-celled carcinoma, many of the cells of which have undergone colloid degeneration." There were no secondary deposits. See *Insp.*, 1890, No. 390.

CASE 224. *Carcinoma of the stomach, with secondary growth in the spinal dura mater, causing paraplegia. Pyelo-nephritis.*—William E., æt. 55, was

admitted under Dr. Taylor, on December 9th, and died on March 8th, 1891, with lumbar pains and incontinence of urine. Since April he has been laid up for three months in bed with an attack of acute rheumatism. On admission there was cedema of the left leg, and the bladder was distended. Until his death, in spite of treatment, his urine continued to be foul and alkaline, and contained pus and blood. Plantar reflex was present, abdominal and cremasteric absent. Abdominal muscles paralysed, but slight weakness in the right leg; none in the left. Ankle clonus on the left side; the knee-jerks were normal. In January there was incontinence of fæces, with involuntary twitchings of both legs. January 30th, suppuration of the left side of the scrotum. He gradually became drowsy and died. At the autopsy a bed-sore was found on the left buttock, and the body was much wasted. The examination of the spinal cord showed a deposit, which microscopically had the characters of carcinoma, on the outer surface of the spinal dura mater on its posterior aspect. This extended from about the 6th to the last dorsal spine. It nowhere exceeded an eighth of an inch in thickness, and in most parts was less. "This deposit," says Dr. Pitt, "had led probably to some compression of the cord, but no changes were visible to the naked eye. The material could be stripped from the laminae, and did not appear to grow into them, or to be connected with them." The kidneys were in a condition of pyelo-nephritis, and there was great cystitis, and the rectum was intensely engorged and inflamed. There were no secondary deposits in the liver, and the spleen which weighed four ounces was healthy. There was acute pleurisy on the right side, and the pulmonary lymphatics were distended. On the posterior wall of the stomach was an area three inches across where the wall was irregularly thickened with old inflammatory deposits. The mucous surface was irregular, and showed several small depressed round scars corresponding to old ulcers. On section the thickening was found to affect the submucous and serous coats, and in concluding the account of the autopsy, Dr. Pitt says: "There can therefore be but little doubt that the thickening in the wall of the stomach was also carcinomatous, and that it was the primary seat of the mischief." See *Insp.*, 1891, No. 90.

CASE 225. *Carcinoma of the anterior wall of the stomach. Secondary deposits in liver, lungs, pleura and lymphatic glands. Ascites. General peritonitis. Fibroid heart.*—Charles M., æt. 67, was admitted under Dr. Taylor on March 31st, with ascites, dyspnoea and cedema, and died on April 11th, 1891. There was four months' history of cedema, with pain in the epigastrium after food. He was tapped after admission on account of a sudden attack of dyspnoea, of which he nearly died, but was relieved by the tapping. He was again tapped on the day before his death. At the autopsy the body was found to be not much emaciated. There were nine ounces of blood in the right pleural cavity and there were numerous secondary deposits on both pleurae and a few deposits in the lungs. There was growth in the bronchial glands. The heart weighed seventeen ounces and showed a general enlargement with much fibroid change in the muscle of the left ventricle. The portal veins were patent and free from any external pressure. There was, however, growth in the hepatic veins and in the inferior vena cava. In the stomach there was an area two and a quarter inches vertically by one and a quarter inches horizontally, situated two inches from the pylorus on the

anterior wall at the superior and inferior part, leaving the posterior wall free. This area is ulcerated and infiltrated with growth which extends through the coats and fungates as a small nodule on the serous surface anteriorly. There is also produced a pouching in this area owing to the involvement of the muscular coat. There are close to the growth, which is at least half an inch thick, several flat nodules on the mucous surface. The rest of the mucous surface of the intestinal canal is normal. There is general peritonitis which has led to coating of the serous surface with lymph and matting of the intestines. The liver was huge, weighing one hundred and thirty-one ounces. It contained numerous nodules of growth, some on the surface, the larger of which are umbilicated. The largest masses of growth are at the posterior part. Near the inferior vena cava there is much growth. This has invaded the hepatic veins and fungated into the cava and there is a large nodular mass close to the right auricle. There was only a small thrombus in the cava, not sufficient to occlude the lumen. The attack of intense dyspnoea a fortnight before death, says Dr. Pitt, probably receives its explanation from this mass of growth interfering with the circulation. The cause of the ascites, says Dr. Pitt, is not quite clear. The portal system appeared to be patent. Probably the interference of the vena cava combined with the growth adjoining the surface of the liver are both factors. The pancreas was healthy. The lymphatic glands also. The spleen showed capsulitis and weighed five ounces. The supra-renal capsules normal. The kidneys showed thickened and atheromatous vessels with a scarred surface. Histologically the growth in the liver consisted of numerous alveoli of various sizes containing closely packed cells, which in the inner portions of the mass have broken down, and in the outer have a cylindrical shape. See *Insp.*, 1891, No. 124.

CASE 226. *Carcinoma of pyloric end of stomach. Secondary deposits in liver and lymphatic glands.*—Edwin N., æt. 69, was admitted under Dr. Goodhart on July 22nd, and died on August 6th, 1891. Since February he has had discomfort in taking food, and for some time occasional vomiting. He has lost weight and latterly he has had abdominal pain. A tumour was felt in the abdomen with an impaired note on percussion. On the 3rd, after an enema, he became much worse and had continuous diarrhoea till his death. A right femoral hernia was strangulated a few days before his death but after some hours was reduced. At the autopsy the body was thin and there was a little quiescent phthisis at the apices. There were two ounces of fluid in the right pleura. The stomach showed a growth extending all round the circumference of the pyloric portion with the exception of the posterior attached margin. This growth projected into the lumen, was ulcerated, leaving a smooth surface and except for one small nodule was sharply limited by the pylorus. The growth extended for three inches and was readily palpable through the abdominal wall. It had a raised, sloping margin. The rest of the stomach and the alimentary canal was normal. The peritoneum contained some turbid fluid and some flakes of lymph. "This may have been set up by the growth or possibly by the strangulated hernia," says Dr. Pitt. The growth extended along the meso-gastrum forming a large mass close to the portal fissure and adherent to the pancreas, which was not invaded, although it was in the midst of the growth. The growth did not involve the portal veins or bile-duct. There was growth

in some of the glands, especially in those surrounding the aorta. The liver was not apparently much enlarged, but contained some nodules of growth two inches across. There were but few secondary deposits in the neighbourhood of these and the surrounding liver tissue was very hyperæmic. The spleen was healthy except for adhesions to the diaphragm. The kidneys showed slight thinning of the cortex but were otherwise normal. "The sections of the growth in the stomach," says Dr. Pitt, "are typically adeno-carcinoma. The sections of the growth in the liver and other secondary deposits are quite different and I should describe them as carcinoma. We have therefore, the coincidence of the two forms of growth in different parts of the body. This confirms me in the view that I have for some time held that the differences which Cornil and Ranvier and other writers would make between these two growths are not fundamental ones; the two may merge into one another." See *Insp.*, 1891, No. 293.

CASE 227. *Carcinoma of the body of the stomach. Perforation. Purulent peritonitis. Secondary deposits in liver and lymphatic glands.*—Samuel A., æt. 42, was admitted on July 15th, and died on November 6th, 1891, under Dr. Taylor, for pain across the abdomen, weakness, and wasting. Two years ago he was a patient in St. Thomas's Hospital, with vomiting, which was cured in six weeks. In September, 1890, he attended Dr. Pitt's out-patients with pain in the abdomen and loss of flesh; he seemed to improve but not sufficiently to go to work. In June, 1891, he vomited blood and came to Dr. Washbourn's out-patients. On admission, there was an ill-defined tumour in the epigastric region a little to the left of the middle line. On the 17th it is noted that the tumour is more palpable and extends to the umbilicus. On the 25th epigastric pain. On August 16th the tumour could not be made out, but the next day it was distinct. August 24th, the patient has lost a stone in weight since the beginning of the month. October 22nd, tumour can not be felt. Now and then much pain in epigastrium. He gradually sank and died, the tumour again becoming perceptible before his death. There were no marked signs of peritonitis, but he lay moribund for several days before the fatal issue. At the autopsy the body was emaciated, and when the abdomen was opened the stomach was found retracted beneath the costal arch on the left side, a fact which explained the difficulty in feeling the tumour. The stomach at the time was empty. There was very general purulent peritonitis, the abdomen containing three pints of turbid liquid. The transverse colon was drawn up and adherent to the stomach. There was œdema of the lower lobes of both lungs, but otherwise they were normal. There were a few secondary deposits in the bronchial glands. The heart weighed eight and a-half ounces and was normal, and the kidneys were also normal. The stomach was occupied by a large prominent cauliflower-like growth, which affected the whole of it except the cardiac and pyloric ends, where about a third of the organ, counting both ends, was spared. The mucous membrane over the growth was for the most part entire, but at the pyloric end and on the posterior wall there was deep ulceration, and a probe passed into one of the deepest parts of the ulcer emerged on the outside. "But whether this was the real opening which led to the peritonitis," says Dr. Perry, "I am not sure; for the stomach was adherent to the neighbouring structures and was torn in parts in the process of removal." The liver weighed forty-nine ounces

and contained some small, white, secondary deposits. The spleen weighed eight ounces and was normal. The supra-renal capsules were normal. "Microscopically," says Dr. Perry, "the growth in the stomach was a columnar epithelioma of the type described by Ziegler as malignant adenoma." See *Insp.*, 1891, No. 415, and Prep. 714.

CASE 228. *Carcinoma of the posterior wall of the stomach. Secondary growth in liver, and abdominal and cervical lymphatic glands. Thrombosis of superior cava.*—William H., æt. 72, was admitted under Dr. Taylor on November 20th, 1891, for pain in the epigastrium and vomiting and died on January 4th, 1892. His illness began six weeks before admission. Vomit coffee-coloured. On admission a distinct oval tumour was felt in the epigastric region. Occasional sickness. Vomit contains blood. Fine râles heard over front and back of chest. Muco-purulent sputum. Much pain in abdomen. Unable to sleep. Gradually sank. At the autopsy the body was that of a healthy-looking old man, looking much younger than his stated age. No emaciation. Slight œdema about both ankles. There was a cancerous ulcer in the pyloric third of the stomach, situated chiefly on the posterior wall, and about two inches from the pylorus. It measured three and a half by two and a half inches. Its edge was much raised, everted and sinuous. Its base was excavated and tolerably hard. It was so thin in one spot that a small laceration was made in removing the viscera. The glands on the convex border of the stomach were enlarged, some being adherent to the growth on its serous surface. The omentum was puckered, and the transverse colon was adherent to the growth, but not in any way invaded. Apart from the growth the mucous membrane of the stomach was healthy, except for one small plaque, the size of a sixpence near the main ulcer. The stomach was hidden by the enlarged liver. It was not constricted by the growth, nor was the whole of its circumference involved. The liver weighed one hundred and twenty-nine ounces, and was stuffed with large secondary deposits, especially the left lobe, which was almost entirely composed of growth. The diaphragm was adherent to the convex surface of the liver. On section the growths were moderately firm. The umbilication of those on the surface was not well marked. No obstruction to bile-ducts or portal veins. No extravasation of bile into the growth. The epigastric tumour felt during life was the left lobe of the liver much enlarged. The spleen weighed four ounces, and showed fibroid thickening of its capsule, but no secondary deposit. The glands round the head of the pancreas were enlarged by growth. The kidneys were healthy. The aorta remarkably good. The inferior vena cava contained a thrombus of about the size of a walnut partially obstructing its calibre. The heart weighed fourteen ounces. There was a deposit of growth in the deep cervical glands on the left side of the neck, and both pleuræ were universally adherent. The lungs were œdematous, and the left lower lobe was much consolidated by broncho-pneumonia. There was also a little broncho-pneumonia in the lower lobe of the right lung. Histological examination of the growth showed that it consisted of tubes cut in various directions, and lined with cylindrical epithelium. The growth was situated in the submucous tissue, and the stretched healthy mucous membrane could be traced over it. The growth was therefore a cylindrical carcinoma. See *Insp.*, 1892, No. 6.

CASE 229. *Carcinomatous infiltration of the stomach. Secondary deposits in liver and lymphatic glands. Obstruction of bile-ducts. Jaundice.*—Jane H., æt. 54, was admitted under Dr. Pye-Smith on January 1st and died on January 15th, 1892. She had been subject to bilious attacks and indigestion since infancy. For three months she had wasted and had vomited after food. For six weeks she had had severe pain and had been jaundiced. The liver was enlarged and the gall-bladder was palpable as an ovoid sac on the outer part of the right hypochondrium, extending about two inches beyond the liver, and forming a mass which was smooth and lay entirely outside a line joining the cartilaginous end of the ninth rib to the umbilicus. The jaundice increased and for the last week of her life she had abundant coffee-ground vomit. She had melæna and died somewhat rapidly at last. At the autopsy the body was wasted and was deeply jaundiced. The stomach is preserved in the museum as Preparation 697 and is thus described:—"A stomach from which the anterior wall has been removed to show an infiltrating growth which extends from the pylorus towards the œsophagus along the whole extent of the lesser curvature and about half way along the greater curvature. The stomach is small and where the malignant growth is most considerable its wall is thickened to the extent of half an inch. The mucous membrane is rugose and but very slightly ulcerated. The muscular coat is hypertrophied and together with the submucous tissue is infiltrated with a growth having the histological characters of spheroidal-celled carcinoma." In the region of the portal fissure there is a very large, hard mass which completely surrounds and occludes the bile-duct. The duodenum healthy and free from bile. The papilla of the bile-duct large but free from growth. The growth can be traced up along the portal area forming small nodules in the hepatic tissue, but none of them of any size and most of them very minute, indicating the scirrhus nature of the growth, with slight infectivity. The gall-bladder formed an ovoid tumour five and a half inches long and three inches broad. It contained twelve ounces of straw-coloured mucus and two gall-stones, one of them of considerable size. The pancreas was extremely hard and dense, embedded in growth but not itself affected. The spleen was healthy. The kidneys weighed ten ounces and were somewhat scarred. The right kidney had a dilated pelvis. The right ureter had been embedded in growth. The lungs were healthy except for a little pus in the tubes. See *Insp.*, 1892, No. 26, and Prep. 697.

CASE 230. *Carcinomatous polypus of the stomach. Secondary deposits in peritoneum, liver, suprarenal capsules, mediastinal, mesenteric and aortic glands.*—Thomas S., æt. 47, was admitted under Dr. Goodhart on January 11th, and died on January 28th, 1892. He came in as a case of acute lead-poisoning. He was a foreman painter. He was jaundiced, a condition first noticed on the 21st of last December. He complained of severe pain running from the loins round the abdomen; and his lumbar pain dated from last September. It was at first thought to be due to kidney or bladder. His bowels were constipated, his liver large, his urine free from albumen, but containing bile, scanty also in quantity. On January 16th he was constantly vomiting and Dr. Goodhart pointed out that the superficial abdominal veins were enlarged. January 23rd, the vomiting continued with distension of the stomach and intestines and constant hiccough. On the 26th there was

blood and mucus in the motions and he was very weak. The vomiting continued until his death on the evening of the 28th, and for the thirty hours preceding death he passed no urine. Clinically the case was exceedingly obscure. At the autopsy the body was thin and much jaundiced. There was no appearance of Addison's disease and no œdema. When the abdomen was opened a little brownish, serous fluid was found in the abdominal cavity. The peritoneum was seen to be studded here and there with minute secondary deposits of cancer, and all the glands along the spine were matted together and enlarged by cancerous deposit. This deposit formed a tough, white mass invading the aorta and cava, and extending into the kidneys along the hilum, and into the pelves of the organs, where it appeared as a multitude of hard, white nodules projecting beneath the mucous membrane of the pelves and calices. In the left kidney the ureter was compressed by the growth. The nerves of the lumbar plexus were implicated in the growth. The nerves also of the sympathetic plexuses must have suffered, as the left supra-renal body was entirely surrounded and infiltrated by the growth, and the right was in a similar condition except that more of the organ remained. The lesser omentum was thickened and infiltrated by growth and its glands enlarged. The greater omentum was drawn up and puckered. There was a very tough mass of cancerous and inflammatory deposit in the portal fissure and all the structures therein must have been considerably interfered with. The right pleura contained twelve ounces of serous fluid: the left was normal. The lungs were normal except for a little basic collapse, and there were numerous secondary deposits in the bronchial glands. The heart weighed thirteen and a half ounces, and was large, but appeared to be normal. The liver was large, and its edge an inch below the costal margin. It did not contain many secondary deposits. It was bile-stained but otherwise appeared normal. The gall-bladder was distended with bile. The pancreas very hard but free from growth. The lymphatic glands, mesenteric and lumbar all enlarged and infiltrated by growth. The spleen weighed six ounces and was normal, and the supra-renals as above mentioned. The right kidney was normal: the left showed dilation of the pelvis from compression of its ureter. The growth in the kidney had the character of a spheroidal carcinoma with scanty stroma and the growths in the liver were of a similar character. The Preparation 677 is preserved of the stomach and is described as follows:—"A portion of a stomach laid open so as to show, upon its anterior wall an inch from the cardiac orifice and from the lesser curvature a lenticular mass of growth three-quarters of an inch in diameter and projecting one-third of an inch above the mucous surface. The rest of the mucous membrane is healthy. The glands in the lesser curvature are enlarged by secondary deposit. On the reverse of the specimen are seen small nodules of growth in the serous coat. Histologically the polypus has the structure of a spheroidal-celled carcinoma with scanty stroma." See *Insp.*, 1892, No. 48.

CASE 231. *Small carcinomatous ulcer on posterior wall of stomach with numerous extensive secondary deposits. Cirrhosis of the liver. Phthisis. Gangrenous pneumonia.*—George F., æt. 59, was admitted under Dr. Pye-Smith on March 10th and died on March 15th, 1892. He came in with pains in the right lumbar region and down the right leg. The patient has had sciatica for more than a year and for the last few months has been unable to take much food because

of pain in his stomach. Has been a hard drinker for two years and for the last six months has taken a very large quantity of whiskey. On admission the patient was noticed to lie on his left side and to wander in answering questions. His mouth was black, apparently from blood. His breath was ill-smelling and his motions were passed involuntarily. No melæna. The liver was much enlarged with a hard and rather uneven surface. Urine's specific gravity 1010, containing neither albumen nor sugar. Pulse 100. Temperature normal, heart and lungs normal. On the 12th the patient recognised no one and he lay in the same condition, except that he gradually became more comatose, until his death on the 16th. He was thought during life to be suffering from cirrhosis of the liver. At the autopsy the body was thin and slightly jaundiced. On the posterior wall of the stomach about four inches from the œsophageal orifice and two and a half inches below the lesser curvature there was a button-like mass of growth three quarters of an inch in diameter and raised about a quarter of an inch above the surrounding mucous membrane. The central part of the growth was ulcerated and thus a cup-shaped appearance was produced. In the floor of the ulcer the submucous tissue was exposed. This growth did not appear on the serous surface and was not continuous with any growth outside the stomach, though there were secondary deposits in the glands of the lesser curvature. The rest of the stomach was normal. "It is unusual," says Dr. Perry, "to find so small a primary growth with so many and large secondary deposits." The intestines were normal but there were large masses of growth in the mesenteric glands. There were some peritoneal adhesions but no peritonitis. The liver weighed ninety-four ounces, it was granular on the surface and was a light yellow colour. There was a considerable degree of cirrhosis but little or no thickening of the capsule. About the anterior edge of the left lobe there was an umbilicated growth which infiltrated the liver substance. It was hard and showed areas of caseation yellower than the surrounding growth. Large glands in the portal fissure may have somewhat obstructed the ducts but the bile could be made to flow into the duodenum without difficulty. The spleen weighed six ounces and contained no secondary deposits though its hilum was in contact with a large mass of glands. Pancreas infiltrated with growth, especially its head. This had been invaded from the neighbouring lymphatic glands. Right supra-renal normal. Left contained a nodule of growth about the size of a pea. Nodules of growth were also found in the thyroid and beneath the epicardium of the right ventricle. The lungs showed phthisis with recent gangrenous pneumonia. Slight ulceration of the anterior edge of the right epiglottis. No secondary deposits in the mediastinal glands. Kidneys healthy except that they were somewhat jaundiced and in the hilum of one kidney was a small secondary deposit and another in the cortex of the other kidney. The right kidney also showed a little scarring. The vesiculæ seminales dilated and cystic. Histologically the growth was a spheroidal carcinoma with very scanty stroma. The alveoli were large. Pieces of growth were examined from the stomach, supra-renal, pancreas and liver; also the thyroid. The liver was extremely cirrhotic, the development of fibrous tissue being not only around but in the lobules. The hepatic cells were fatty. The cirrhosis was independent of the growth. See *Insp.*, 1892, No. 101.

CASE 232. *Carcinoma of the pyloric end of the stomach. Secondary deposits in the liver and bronchial lymphatic glands.*—John H., *set.* 74, was admitted under Dr. Taylor on April 14th, and died on April 27th, 1892, having been ill since December, 1891, and having been unable for the last six weeks to take solid food. On admission an ill-defined tumour could be made out at the epigastrium. The patient became weaker, and gradually sank. At the autopsy the body was emaciated. The lungs were small and emphysematous, and there was a good deal of pneumonic consolidation in the right middle lobe. There were secondary deposits in the bronchial glands. The kidneys weighed five ounces, and were markedly granular, though the heart, which weighed eight ounces, showed no hypertrophy. The stomach presented a malignant growth, encircling the pylorus, and sharply limited towards the duodenum by the pyloric ring. On the anterior wall the growth extended two inches along the lesser curvature, and the same distance along the greater curvature; on the posterior wall it extended two inches along the lesser, and one and half inches along the greater curvature. On opening the stomach the growth was found to be situated chiefly in the submucosa, but it invaded the muscle, and produced nodular excrescences on the serous surface. The mucous membrane over the growth was normal, except for an irregular ulcer an inch in length, situated on the lesser curvature just within the pylorus. There were several small secondary deposits on the under surface of the right lobe of the liver. Histologically the growth was a spheroidal-celled carcinoma with abundant stroma. *See Insp.*, 1892, No. 155.

CASE 233. *Carcinoma of the greater curvature of the stomach. Secondary deposit in omentum. Strangulated hernia.*—Isabel S., *set.* 75, was admitted under Mr. Davies-Colley on August 22nd, 1892, for a strangulated inguinal hernia. She was suddenly seized with vomiting and collapse on the day before admission. She had been melancholic for some time. Directly after admission the usual operation was performed for inguinal hernia on the left side. A few hours afterwards the patient vomited a good deal, and brought up some feculent material. Since that time she had become steadily weaker, and on the 29th she became drowsy, collapsed, and died in the afternoon. At the autopsy the body was found to be well nourished with abundance of fat. It was not discovered what portion of the bowel had been in the sac of the hernia, the whole of the gut looking healthy. There was no ascites. Over one or two coils of small intestine there were a few patches of recent lymph. Situated near the pylorus on the greater curvature was a flat growth measuring three by three and half inches, with hard raised edges, and soft friable centre. The growth extended to the posterior and anterior walls of the organ, and in the centre the growth had protruded into the omentum in which was a secondary deposit, the size of a walnut, surrounded by inflammatory thickening. The liver weighed thirty-eight ounces, and was soft and fatty. It was free from secondary deposit, as were also the abdominal lymphatic glands. The spleen was very small, weighing one ounce. The aorta was atheromatous, the lungs emphysematous. The heart weighed eight and half ounces, and showed an abundance of fat on the front of the right ventricle. The muscle and valves were healthy. The kidneys weighed eight ounces, and were somewhat soft, and there were three calcified cysts in the right broad ligament. *See Insp.*, 1892, No. 295.

CASE 234. *Carcinoma of the stomach with extensive sloughing. Secondary deposits in small intestine and mesenteric glands.*—George G., æt. 38, was admitted under Dr. Hale-White on September 6th and died on November 2nd, 1892. He came in with pain after food and emaciation. Shortly after admission an epigastric tumour became palpable. Ascites soon developed. He died greatly emaciated. At the autopsy the greater part of the stomach was found to be infiltrated by a growth sharply limited to the pylorus, extending along the lesser curvature to the cardiac orifice and involving the greater part of the anterior wall and to a less extent the posterior wall. Considerable areas of this growth had sloughed, leaving only a thin muscular and serous coat. The growth was an inch thick near the pylorus, where there was also much muscular hypertrophy. The edges of the growing margin were overhanging. The growth involved the glands near the portal fissure and the mesenteric glands. From these latter in many places the growth extended to the jejunum and ileum, where the bowel was involved on its mucous surface. There were innumerable secondary growths involving the small intestine in this manner. The mass of glands in the portal fissure pressed upon the portal vein and produced ascites. There was no growth in the peritoneum except lines of growth which extended from the mesenteric glands. The liver weighed thirty-two and a half ounces and was normal. The gall-bladder contained masses of bile pigment. There was local capsulitis of the liver and spleen. The growth surrounded the pancreas but did not involve it. The pleuræ presented old adhesions on both sides and there was pus in the larger tubes of the lungs. The heart weighed six ounces and was wasted, and the left testis was slightly fibroid. The growth in the stomach was a carcinoma. The alveoli were large and were filled with large, succulent cells. There was muscular hypertrophy with inflammatory cell-infiltration. See *Insp.*, 1892, No. 394.

CASE 235. *Carcinoma of the lesser curvature of the stomach. Secondary deposits in the pancreas, mesentery, lymphatic glands, recto-vesical pouch, and in the rectum. Jaundice.*—Thomas I., æt. 56, was admitted under Dr. Hale-White, on October 28th, 1892, with jaundice and weakness. About four months ago he had a bad attack of indigestion, and three weeks later he suddenly became jaundiced. He had been losing flesh ever since, and gradually getting weaker. On admission no abdominal tumour could be felt, nor was one felt at any time. In the rectum, however, a hard nodule of growth could be made out. Whilst he was in the hospital the patient suffered much pain in the epigastrium which kept him awake at night. He sank and died on November 15th, with no symptoms pointing definitely to the stomach as the seat of the primary disease. At the autopsy the body was deeply jaundiced. The stomach when laid open was found to contain a growth mainly situated on the posterior wall, but extending almost the whole length of the lesser curvature, and coming round slightly on to the anterior wall. Just at the pylorus the growth was in the submucous tissue, thickening it, and raising it up; but in the older part it took the form of prominent masses, some ulcerated and some covered with red mucous membrane. At the fundus there was a second mass of growth projecting beneath the mucous membrane, and this was due to an invasion of the stomach wall by the tail-end of the pancreas surrounded and thickened by a deposit of secondary growth. The glands in the portal fissure were

much enlarged and compressed the structures there situated. "I could get nothing," says Dr. Perry, "along the cystic duct, and only with difficulty along the hepatic duct could I pass an ordinary probe." In the mesentery of the intestine there were many secondary deposits contracting it, but not enough to produce obstruction, and in many points these deposits appeared as small, button-like masses beneath the mucous membrane at the attached border of the gut. In none of them was there ulceration of the mucous membrane covering them. The large intestine was normal, except there were deposits in the recto-vesical pouch, which had invaded the rectum. In this were two deposits, one a little to the right of the median anterior line, four and a half inches from the anus, which was about half an inch long and oval in shape; and another half an inch above this first deposit which was rather smaller, but with a cupped, ulcerated surface. There was much turbid serum in the peritoneal cavity, no less than fourteen pints of it, and the coils of intestine were covered with recent lymph. There was much recent lymph on the capsule of the liver, but no secondary deposit. The branches of the bile-duct in the liver were dilated, but only moderately so. The gall-bladder contained a thick, greenish mucus, which could not be squeezed out of it. The walls of the viscus were very œdematous. The mesenteric glands as well as those in the portal fissure contained secondary deposits. The spleen was invaded from the tail of the pancreas by growth spreading in at the hilum. In consequence of the obstruction of the artery and its branches there were several small, dark infarcts. There was old pleurisy on the right side, and on either side of the chest about eight ounces of serous fluid somewhat compressing the bases of the lung. The heart weighed eight and a half ounces, and was brown. There was slight atheroma of the aorta. The kidneys were normal. The prostate was normal. There was secondary deposit in the peritoneum over the bladder, which itself was healthy. See *Insp.*, 1892, No. 416, and Preps. 698 and 1016.

CASE 236. *Carcinomatous stenosis of the pylorus. Secondary deposits in lymphatic glands.*—Richard A, æt. 51., was admitted on November 23rd, 1892, with a history of dyspepsia for two years. For the last two months a tumour had been noticed in the epigastrium, where a hard, irregular, nodular mass was palpable. This varied in position, being sometimes to the right and sometimes to the left of the middle line. For a long time he had been incessantly sick. He improved greatly and went home at his own desire on December 19th; but two days later he was again admitted much worse, and died exhausted on December 27th. At the autopsy the body was greatly emaciated and there was a scar of healed phthisis at the apex of the left lung. The heart was also wasted; the aorta atheromatous. The stomach was greatly dilated, but the sac projected up under the ribs and the greater curvature of the stomach was not lower than normal. To the right of the middle line beneath the free margin of the ribs there was a hard nodular mass which consisted of growth in the pylorus matted to the colon and extending into the adjacent glands near the foramen of Winslow. The mass did not extend down to the umbilicus: the abdomen was rather empty. The stomach contained two or more pints of beef-tea-like fluid, and when laid open was dilated but healthy in appearance over the whole of its surface except the two inches near the pylorus. This part was infiltrated with growth which was

dense and fibroid and bounded sharply at the pylorus. The growth was three-quarters of an inch thick close to the pylorus, but further from the pylorus was only a quarter of an inch thick. The pylorus was stenosed, and would not admit a small finger tip. The growth was adherent to the fundus of the gall-bladder, where a layer of growth had run in the subserous coat for an area of half an inch across. There was growth surrounding the pancreas, which was very tough, but not invading it. It grew in the connective tissue and ran in contact with the common bile-duct, and the portal vein but did not compress either. The colon was free from growth. The liver weighed thirty-five ounces, and was wasted, but free from secondary deposit. The spleen showed old capsulitis, was hard and weighed seven ounces. The left supra-renal capsule was embedded in growth but not involved. The kidneys weighed seven ounces and the ureter of the left kidney soon after leaving the kidney was embedded in growth and doubtless compressed, the pelvis of the kidney being dilated. Histologically the stomach showed a typical rapidly growing carcinoma. The muscular coat was infiltrated with columns of large cells running in places in single lines along the lymphatics. See *Insp.*, 1892, No. 473.

CASE 237. *Carcinoma of the pyloric half of the stomach. Secondary deposits in liver, lung, peritoneum, and in the cervical, mediastinal and mesenteric glands.*—Alfred D., æt. 37, was admitted under Dr. Pye-Smith on January 14th, 1893, with pain in the left side, loss of appetite, vomiting and sleeplessness. Four months ago he first noticed a small lump on the left side of the abdomen which had increased. On admission it was thought that the edge of the liver could be felt at the level of the umbilicus and the edge of the spleen an inch below the umbilicus. The surface of the liver was thought to be uneven, and since the patient came from a marshy district it was considered that the enlargement of the spleen might be due to malaria. There were rales and rhonchi over both sides of the chest and dulness behind as high as the ninth rib on the right and the tenth on the left side. The breathing at the right apex was very loud. 18th, bronchophony at the right apex behind. 20th, dyspnoea. Pulse 120°. The patient died on the following day at 6 p.m., and at the autopsy the body was thin and the cervical glands were greatly enlarged by cancerous infiltration. "I should have thought," says Dr. Perry, "that some might have been felt in the neck above the clavicle but it seems that they were not so discovered." The pleuræ showed some old organised adhesions and there was recent pleurisy. The lymphatics in the lungs were full of cancerous material and the middle third of the right upper lobe was in a condition of grey hepatisation. The glands of the mediastinum and bronchi were enormously distended with cancerous deposit. The pericardium was normal. The heart weighed nine ounces. The right side of the chest contained twenty-five ounces and the left twenty ounces of fluid which was milky in character, like that in the abdomen. When the abdomen was opened there was about a pint of milky white fluid like the contents of the lacteals. The liver was seen lying in its normal position and of the usual size. The stomach also looked normal as far as its cardiac half was concerned but the pyloric half was thickened and hard and evidently infiltrated with growth. There were large deposits in the glands of the greater omentum which formed a row of ovoid tumours the size of cherries close up to the greater curvature and running across

towards the spleen which itself could neither be seen nor felt without some difficulty. It was the thickened stomach and row of enlarged glands which had no doubt been taken for the liver and spleen. The mesenteric and abdominal glands generally were enlarged by deposit and formed a thick mass surrounding the vena cava and aorta. When the stomach was laid open the growth was seen to be closely limited by the pylorus and to involve all the walls of the pyloric two thirds of the viscus. The growth had a well-defined border, was chiefly situated in the submucosa, showed a little ulceration and was, as above said, sharply limited by the pylorus. There was abundance of growth in the structures of the lesser curvature, in the glands and in the lesser omentum. The mucous membrane of the unaffected part of the stomach was cedematous and ecchymosed. There was here no ulceration. The liver weighed fifty-nine ounces and contained several nodules of growth, the largest as big as a walnut and the smallest as big as a cherry. In one of the growths extensive hæmorrhage had occurred. The growths in the liver were circumscribed, generally white and soft, and projected very little above the surface. There were enlarged cancerous glands in the portal fissure and cedema of the wall of the gall-bladder. There were also little secondary deposits on its serous covering. The pancreas was normal. There were secondary deposits in the mesenteric and lumbar glands. The spleen weighed three and a half ounces and was normal. There was a nodule of growth the size of a pea in the left suprarenal capsule. The kidneys were hard like cardiac organs and there were small secondary nodules of growth in the recto-vesical pouch. There was hardness of the kidneys due to pressure upon the vena cava and renal veins by growth. These vessels, however, were not actually invaded by growth. *See Insp.*, 1893, No. 30.

CASE 238. *Carcinoma of the anterior wall of the stomach, possibly secondary to simple ulcer. Secondary deposits in liver and lymphatic glands.*—Arthur C., æt. 41, was admitted under Dr. Goodhart on September 14th, 1893, with ascites and enlargement of the liver. He was a temperate man by the testimony of his friends. Eight years ago he had hæmatemesis to the amount of three pints, followed by melæna for a week. His present illness dates from the 7th of August, when he was seized with a severe pain in the right side of the abdomen and afterwards vomited. The pain lasted about three days and a week later he had a second attack caused by lifting a carpet. He had also frequently vomited after food. This fact led to the idea that the primary seat of growth might be found in the stomach, and the house-physician tells me that Dr. Shaw, noting that he was said to have had hæmatemesis eight years ago, hazarded the suggestion that there might have been a gastric ulcer which in process of time had become cancerous. His abdomen was first noticed to be swollen ten days before admission, when the doctor drew off three quarts of clear fluid, and the same evening the feet were observed to be swollen. Great pain at night and diarrhœa for the last fortnight. On admission he was slightly jaundiced, and the veins over the abdomen were dilated. The liver has a hard uneven edge. After admission he complained of constant pain and sickness after food, and towards the end he became very restless and finally died comatose a fortnight after admission. At the autopsy the body was very thin and there was considerable jaundice. Œdema of the feet, and the abdomen was distended with a clear serous fluid measuring about six pints.

There was no recent peritonitis, but the liver was adherent by firm adhesions to the anterior abdominal wall and the stomach was adherent to the liver. There was old and recent capsulitis of the spleen. On the right side there was some recent pleurisy and slight compression. Both lungs were large and emphysematous and shewed numerous hæmorrhages. Dr. Wilks, who was present at the autopsy, pointed out the hæmorrhages as illustrating the dangers of bleeding and wet-cupping in jaundice. The heart weighed nine and a half ounces, and the kidneys were healthy except that the right was extremely small, not weighing more than an ounce. The anterior wall of the stomach was adherent to the liver, and on opening the organ along its greater curvature the mucous membrane was seen to be pale. Towards the pylorus three-quarters of an inch from the ring and an inch below the lesser curvature, there was a circular raised growth about an inch in diameter on the anterior wall. The growth projected about a third of an inch internally and at two points there were some appearances of old ulceration. The liver weighed twelve pounds, irregular in shape and contained a large number of cancerous tubera, varying in size from a pea to an orange. In some parts they were so closely packed as to suggest an infiltration; but for the most part they existed as circumscribed globular masses. The part of the liver unaffected with growth was normal, congested, and in many places showed darker areas which were probably due to infarction. No cirrhosis. The pancreas was normal, but the glands around the head of it were infiltrated and enlarged by growth. The bile flowed easily from the gall-bladder, and I could not make out any interference with the ducts. The glands in the portal fissure seemed not to contain growth. The spleen weighed seven ounces and was tough, its surface being rough from deposit of old and recent lymph. The supra-renal capsules normal. Histological examination of the growth showed the muscular and serous coats infiltrated. The alveoli were large and were filled with spheroidal cells. The central portion of the alveoli had become caseous. See *Insp.*, 1893, No. 381.

CASE 239. *Carcinoma of the pylorus. Subserous abscess. Secondary deposits in duodenum and liver.*—Richard J., æt. 51, was admitted under Dr. Pye-Smith, on November 25th, 1893, for continuous vomiting and exhaustion. His present illness dates from last August, at which time he began to suffer from severe vomiting, this being his only symptom of disease. He suffered no pain, but lost weight considerably. He has been a heavy drinker. On admission he was in a very weak and collapsed condition. On examination the liver was found to be enlarged, and the vomit was of a pale, brown colour containing blood. Blood was also passed in the fæces. At 10 p.m., on the 25th, he vomited a dark brown fluid containing fæcal matter. Became gradually weaker, and died at 2 a.m. on November 27th. On account of the fæcal vomiting gastro-colic fistula was diagnosed, the primary disease being regarded as carcinoma of the stomach. At the autopsy the body was very much wasted, and the lungs were cedematous. The left lobe of the thyroid was displaced so as to lie two inches below the lower margin of the cricoid cartilage. The left lobe of the thyroid also contained a cyst. The heart was healthy. The stomach was found to present an encircling growth at the pylorus about an inch in transverse measurement. Connected with this growth was a soft, fluctuating mass over the upper and anterior surface

of the pylorus about the size of a pigeon's egg, which, when opened, proved to be a subserous abscess containing half an ounce of greenish-yellow pus. There was also at the upper and anterior surface of the first part of the duodenum a large, spherical, reddish-brown mass, nearly the size of a tennis ball, projecting into the lumen of the gut, and looking very much like altered blood clot, but consisting of carcinomatous deposit apparently not directly connected with the original cancer. The hepatic flexure of the colon was pushed down by the mass of growth at the pyloric end of the stomach. There was no ascites. The pancreas was healthy. The spleen six ounces, and hard. The kidneys twelve ounces, and healthy. The liver was not weighed, but contained several large, round, hard masses of secondary growth, varying in size on section from a split-pea to a shilling. Sections of the stomach growth showed that it was a cylindrical carcinoma. Sections of the duodenal growth showed in parts a similar structure, whilst in others the growth, which was somewhat hæmorrhagic, presented the structure of a spheroidal carcinoma, the cells lying in large alveoli. *See Insp.*, 1893, No. 464.

CASE 240. *Carcinoma of pyloric end of stomach possibly arising from a simple ulcer. Obstruction of intestine from contraction of secondary deposits in the peritoneum. Laparotomy. Pneumonia.*—Ellen B., æt. 29, was admitted under Dr. Goodhart for abdominal pain and intestinal obstruction, on December 9th, and died on December 18th. Since 1888 she has been subject to attacks of indigestion and vomiting, with constipation. Her last attack took place in October, when she was treated by her doctor, who said that she had ulcer in the intestine. She was said to have had no motion for six weeks before admission. Three days before admission fæcal vomiting came on and Mr. Symonds examined the patient and found per rectum a mass on the right side of the pelvis about the size of a walnut. On admission the abdomen was distended and there was visible peristalsis of coils of intestine. No tumour. The urine contained albumen and bile. On December 11th the patient vomited twice and Mr. Symonds performed laparotomy, discovering small malignant granulations upon the mesentery, intestine and peritoneum. Later a left anterior colotomy was performed and on December 15th an artificial anus was made. On the next day copious motions were passed both per rectum and through the artificial opening. On the 18th the patient gradually sank, and at the autopsy the lungs generally were cedematous and there was a considerable amount of hypostatic pneumonia of the right lower lobe. The heart was small, weighing five and a half ounces. There was recent purulent peritonitis and the peritoneum was studded with a number of small, whitish yellow nodules of malignant deposit about the size of tubercles. The stomach was examined and the pyloric end was infiltrated with a hard, thick, scirrhus-like growth which was thickest just above the pyloric ring. It appeared to involve the body of the organ up to about three and a half inches from the pyloric ring. On the posterior surface just below the lesser curvature was the cicatrix of an old ulcer about the size of a shilling, hard and thickened, "and this," says Dr. Bryant, "was probably the starting point of the growth." There was considerable matting of the pyloric end of the stomach, duodenum and hepatic flexure of the colon; and the colon at this point was obstructed by a malignant deposit which had apparently spread from the pylorus and had involved the peritoneum and the muscular coat of the colon.

The mucous membrane appeared to be free and there was no fistula. There was a second obstruction in the region of the sigmoid, also produced by a contracting secondary growth in the meso colon at this part. The kidneys were healthy. Liver fifty-six ounces, healthy. Gall-bladder and pancreas healthy. Lymphatic glands enlarged but not stated to contain secondary deposit. The spleen four ounces, small and hard. Supra-renal capsules, kidneys and pelvic organs healthy. See *Insp.*, 1893, No. 489.

CASE 241. *Carcinoma of the cardiac end of the stomach and lower part of the œsophagus. Secondary deposits in lymphatic glands and suprarenal capsule.*—Abraham L., æt. 52, was admitted under Dr. Taylor on January 4th, 1894, and died on February 9th. He had suffered from dysphagia for six months, and great emaciation. A bougie was passed sixteen inches but it is uncertain whether it entered the stomach. Vomiting and pain were prominent symptoms, and during the greater part of his stay in the hospital he was fed by the rectum. At the autopsy the body was profoundly emaciated and the lungs were small, emphysematous and œdematous, with commencing early pneumonia at the left base. The heart weighed twelve and a half ounces; the left ventricle being contracted and the coronary arteries extremely atheromatous. There was dilatation of the last three inches of the œsophagus. The stomach was small, the cardiac portion being invaded by a diffuse growth occupying an area three inches long and four inches in circumference. The growth extended two inches up the œsophagus, thickening the tube so that in the thickest part it measured three-quarters of an inch. In the stomach the growth formed an excavated hollow near the cardia. There was ulceration over a small area in several spots, but nowhere was the ulceration deep. The pyloric portion of the stomach and the rest of the alimentary canal were normal. The cardiac orifice was dense and very small, admitting a finger with difficulty. The obstruction at the orifice was chiefly due to the mass of adherent glands which were invaded by the growth. These formed a mass three inches long and more than one and a half inches across, and there was also a small amount of growth in the glands, along the aorta for some distance. The left supra-renal capsule was invaded by growth. The liver weighed forty-three ounces, and was wasted but otherwise healthy. The gall-bladder distended. Pancreas normal. Lymphatic glands in the neighbourhood of the growth invaded. Spleen seven ounces, and firm. Kidneys, nine ounces, tough and dark in colour but apparently normal. See *Insp.*, 1894, No. 64.

CASE 242. *Carcinomatous stenosis of the pylorus. Secondary deposits in duodenum and lymphatic gland.*—Jane N., æt. 60, was admitted under Dr. Pye-Smith, on December 11th, 1893, and died on February 12th, 1894. She had been ill for a year, and for the last six months had lost flesh. Her prominent symptom was vomiting, a tumour in the epigastric region being noticeable for three months before death. At the autopsy the body was much wasted, and the heart weighed eight and half ounces, and the kidneys were finely granular. There were general adhesions of the right pleura, and muco-pus in the bronchial tubes. The stomach was not dilated. The pylorus was stenosed, so that even a tip of the finger could not be introduced. The growth extended for about one and quarter inches from the pylorus, and

there was one minute nodule which extended into the duodenum. The growth was extremely dense and cicatrised. The internal surface presented some ulceration over an elongated patch a quarter of an inch by an inch. Near the pylorus the muscular coat was greatly hypertrophied, measuring half an inch in thickness; but there was no general hypertrophy of the gastric wall. The growth at the pylorus had involved the serous and the mucous coats and lines of growth were visible in the muscular coat, but at the spreading margin the growth was limited to the mucous and submucous tissues. The stomach contained five plum stones, a great pip, numerous fig seeds, and one cherry stone. There was a small amount of viscid mucus. The growth was adherent to the pancreas and the transverse colon, but these were not invaded. There was one minute gland on the surface of the duodenum near the pancreas which showed malignant deposit. Otherwise there were no secondary growths, and the growth was limited to the stomach and duodenum as above mentioned. The liver weighed forty-one ounces, and was wasted and somewhat deformed by tight-lacing. The spleen was firm, and weighed four ounces. The supra-renal capsules normal. "Histologically the growth," says Dr. Pitt, "is an adeno-carcinoma, for in many places the typical formation of spaces with cells lining them, and a central cavity is present; but there are also many places where the infiltration in columns along lymphatics is seen, which, if seen alone, would be called carcinoma." See *Insp.*, 1894, No. 67.

CASE 243. *Gastric ulcer becoming carcinomatous. Perforation. Secondary deposits in lymphatic glands.*—Nicholson B., æt. 64, was admitted with abdominal pain, wasting and vomiting, under Dr. Hale-White on April 4th, 1894, and died on April 29th. In January of the present year he was a patient under Dr. Pye-Smith, having been admitted for vomiting and abdominal pain. He was discharged relieved on February 8th. He was a moderate drinker, has had syphilis and, twenty-three years ago, intermittent fever. No history of hæmatemesis. On admission anæmic and much wasted. It was stated that a deeply-seated swelling the size of a hen's egg was made out opposite to, and to the left of, the umbilicus. It was hard and nodular and was felt to expand synchronously with the pulse. What this tumour was the autopsy did not disclose, and on the 6th of April it is stated that no tumour could definitely be made out. The patient was much constipated. Lungs emphysematous. Urine contains neither albumen nor sugar. April 5th, pain and sickness. April 7th, abdominal pain and sickness. 14th, slight hæmatemesis. One tea-spoonful of brown blood. 23rd, has lost two pounds in weight since admission. 28th, diarrhoea and fainting. 29th, died at 4.10 in the afternoon. At the autopsy the hair was grey and the body wasted. The lungs were emphysematous with healed phthisis at the apices. No secondary deposits in the thorax. The heart weighed ten ounces and the valves, though slightly atheromatous, were competent. The aorta was very atheromatous. When the abdomen was opened, the intestines were found to be covered with recent lymph. The stomach was small and with the pancreas was drawn up beneath the diaphragm. "Searching for the cause of the peritonitis," says Dr. Perry, "I found a perforation about a third of an inch in its longest diameter on the lesser curvature of the stomach close to the œsophageal orifice. The serous surface around was free from adhesions nor did the

abdominal cavity contain any material from the stomach. On opening the stomach I found in it a clot of blood about two and a half inches in diameter and half an inch thick, resembling in shape a small placenta." Much of the mucous membrane of the stomach and of the first two feet of the intestine was stained with blood. The perforation was close to the edge of an ulcer which was saddle shaped, extending along the anterior wall, along the lesser curvature, and on the posterior wall as far as the greater curvature. On the floor of the ulcer could be seen the ends of a number of vessels in some of which was recent thrombus. The edges of the ulcer were thick, soft, white and cancerous and there were little nodules of growth in the surrounding mucous membrane. There was a secondary deposit in a lymphatic gland close to the lesser curvature. The glands around the pancreas were also enlarged by growth and with that organ were closely adherent to the stomach. There was general peritonitis but not much fluid in the peritoneal cavity. The liver weighed fifty-one ounces and was normal. No secondary deposits. Some of the mesenteric glands were cancerous. The spleen weighed three and a half ounces and was normal. Supra-renal capsules normal. Kidneys ten ounces and normal. "I think," says Dr. Perry, "this is a very good example, as far as could be judged by post-mortem appearances, of an ulcer becoming carcinomatous; but on the other hand there was no history of long-continued indigestion nor of hæmatemesis. Therefore on the clinical side the evidence is inconclusive." See *Insp.*, 1894, No. 176.

CASE 244. *Carcinoma of the pylorus commencing in an ulcer. Membranous vaginitis.*—Frances McC., æt. 73, was admitted under Dr. Goodhart for hæmatemesis and vomiting on May 19th, 1894, and died on June 14th. There is a tumour in the epigastric region. On the 26th the patient became unconscious, three days later she improved. On the 31st she passed blood with her motions. Her condition was one of increasing weakness and failure of nutrition. At the autopsy the body was extremely emaciated and the heart weighed twelve ounces. The kidneys were healthy. On the posterior wall of the stomach, an inch from the pylorus and from the lesser curvature, there was an ulcer an inch long exposing the muscular coat. From its base malignant growth, which was sharply defined at the pylorus, extended. The muscular coat was hypertrophied, and the thickening due to the growth extended for two inches. "There was no overhanging edge of growing mucous membrane," says Dr. Pitt, "such as is present when the growth starts in the mucous membrane; but there was no doubt that the growth had originated in the floor of the ulcer, and had extended laterally along the deeper coats." The rectum and the rest of the alimentary canal were normal. The liver weighed fifty ounces, and was slightly nutmegged, but free from deposit. The gall-bladder was dilated to one and half inches in circumference, and was free from gall-stones. The spleen weighed three ounces, and was normal. The supra-renal capsules were normal. There was membranous vaginitis. Histological examination of the stomach showed a diffuse carcinomatous growth invading all the coats in the sections examined. There was abundant spheroidal-celled growth running in closely aggregated columns. See *Insp.*, 1894, No. 230.

CASE 245. *Carcinoma of pylorus. Resection. Secondary deposits in lymphatic glands.*—Mary C., æt. 55, was admitted for a lump in the abdomen, under Mr. Lane on August 19th, 1894, and died on August 27th. The patient had previously been in Guy's and in the London Hospital for symptoms of indigestion, admission to Guy's being in the year 1891. On the present admission there was a swelling in the epigastrium the size of an egg. There was no jaundice or swelling of the feet. After admission she did not vomit and on the 23rd the stomach was washed out preparatory to an abdominal section with a view to removal of the growth, if possible. Mr. Lane operated on that day and discovered a pyloric growth and removed it, the opening in the stomach being closed and a fresh aperture made in the anterior wall which was connected with the cut end of the duodenum, by a Murphy's button. The wound in the abdomen was closed. Vomiting was persistent after the operation and the patient gradually sank and died on August 27th, at 8.10 a.m. At the autopsy the abdominal wound was well closed except on the inner surface where the peritoneum could not be brought together. The lungs were emphysematous. The coronary arteries were atheromatous. The heart weighed eight and a half ounces. The lower half of the œsophagus was distinctly bile-stained from vomiting, "showing free passage of bile," says Mr. Targett, "from the duodenum through the Murphy's button into the stomach and œsophagus." The stomach was well closed where the growth had been removed and the new aperture seemed firmly united to the end of the duodenum. The edges of the two organs which were nipped by the button were dark, infiltrated with blood, and not adherent. "They were no doubt," says Mr. Targett, "sloughing." The surface of intestinal coils near the operation wound was sprinkled with blood, but there was no lymph, no effusion, and no fluid in the peritoneal cavity. The abdomen was not washed out after the operation. The pancreas was normal but a few lymph glands in the small omentum contained small secondary deposits of firm growth. The liver weighed thirty-six ounces; spleen, three and a half ounces; kidneys, eight ounces; and all were normal. "As regards the tumour," says Mr. Targett, "I was informed that it consisted of a firm growth of the pylorus not much ulcerated. The portion of alimentary canal removed was about two and a quarter inches in length." *See Insp.*, 1894, No. 337.

CASE 246. *Carcinoma of the pylorus. Secondary deposits in lymphatic glands.*—John W., æt. 58, was admitted on the 9th August, 1894, and died on September 13th, under Dr. Perry. He was suffering from great irritability of the stomach with abdominal pain, and he was greatly emaciated. For the last two years has had spasms and indigestion. Nine weeks ago he had a bad attack of diarrhœa followed by vomiting, the diarrhœa lasting ten days and the vomiting having persisted ever since. He vomits two or three times a day, and has brought up as much as three pints at once. On admission, there was no tumour to be made out, but on the left side there was occasionally a globular prominence which faded under observation and was the contracting end of the stomach with visible peristalsis. Whilst he was in the hospital he had occasional attacks of vomiting, but they were not numerous, and what food he took seemed to pass out of the stomach fairly easily, and the organ never gave evidence of anything but slight dilatation. The vomit was

sometimes of coffee-ground appearance and gave the blood-reaction with guaiacum. His abdomen was only slightly tender, and ordinary examination he would submit to without complaint of pain. He got progressively weaker and died on September 19th in the evening. He was a very small man and greatly wasted withal. The pleuræ showed some black sub-pleural fibroid nodules, and the lungs which were deeply pigmented were somewhat emphysematous. There was œdema of the epicardium and the heart weighed six and a half ounces, and was atrophied and brown in colour. Seen from the outside the stomach looked rather large and measured seventeen inches along its greater curvature. At the pyloric end there were old adhesions and thickening of the pyloric coat. On opening it up there was found an encircling growth sharply limited to the pyloric ring, just admitting the index finger and extending two and a half inches inwards towards the cardia. It was an infiltrating growth chiefly in the submucosa though the muscle was also thicker than normal and marked by fibrous septa which probably were cancerous. The mucous membrane was smooth over the growth and presented only traces of ulceration. There were a few small glands in the omentum and in one of them was a small nodule of firm white growth. With this exception there were no secondary deposits. At the lower end of the ileum were numerous filiform polypi. The liver weighed forty-five and a half ounces. The gall-bladder was distended with bile and measured five inches in length, lying towards the left along the anterior margin of the liver. The spleen weighed three and a half ounces and was normal. The kidneys also were normal. See *Insp.*, 1894, No. 363.

CASE 247. *Carcinoma of the pylorus and duodenum. Secondary deposits in the liver and lymphatic glands.*—William H., æt. 53, was admitted for vomiting and wasting, dating from July, under Dr. Hale-White, on September 16th, 1894, and died on September 22nd. Two hard masses were felt in the epigastric region, thought to be growth in the anterior wall of the stomach, or in lymphatic glands. He steadily became more feeble, and delirious until his death. At the autopsy the body was extremely emaciated and pigmented. There was a calcareous nodule at the right apex, an old tuberculous relic. There were also numerous fibroid nodules in the superficial lymphatics surrounding masses of pigment. The heart weighed twelve ounces, and was normal. Malignant disease surrounds the pylorus, but has not produced any stenosis. The growth has infiltrated the mucous and sub-mucous coats, and the surface has ulcerated and sloughed, presenting a smooth, clean surface over an area two inches by one and half inches; and this sloughed portion of growth reaches to within an inch of the pylorus. The growth extends not only up to the pylorus, but three minute nodules have infiltrated the duodenum, "which," says Dr. Pitt, "is unusual." The spread of the growth along the subserous coat is more extensive, occupying an area of the stomach three and three-quarters of an inch by four and a half inches. The stomach is congested. The rest of the alimentary canal is normal. The liver weighed sixty-two ounces, and was infiltrated with innumerable secondary growths, uniformly scattered throughout the organ, the larger ones caseating in the centre. There is no umbilication in those growths which reach the surface of the organ. The pancreas was normal. There were secondary growths in the glands behind the pylorus,

and in the glands along the aorta. The larger ones had caseated. The spleen six ounces, enlarged and firm. The supra-renal capsules and kidneys normal. Microscopical examination of the stomach growth showed it to be a typical carcinoma. In the sections examined the mucous membrane was intact; the serous and muscular coats were invaded. See *Insp.*, 1894, No. 374.

CASE 248. *Carcinomatous ulcer of the pylorus and colon. Perforation of stomach and peritonitis.*—Ellen B., æt. 56, was admitted for ascites, under Dr. Pye-Smith, on October 10th, 1894, and died on November 1st. She has been accustomed to drink three or four glasses of beer a day, and four years ago was treated for congestion of the liver. For the last year she has been sick on lying down after food but not if she sat up. She has also had pain in her left side independent of the ingestion of food. Seven weeks ago her legs began to swell and the vomiting ceased. On admission signs of ascites were noted, and the vomited material was found to contain some blood and sarcinæ. Succussion-splash elicited. Urine, specific gravity 1026, and normal. On the 13th Dr. Pye-Smith diagnosed ascites, probably from portal constriction. The liver and spleen could not be felt. On October 28th, the pain and sickness having hitherto remained much the same as on admission, the patient developed signs of peritonitis, the temperature being 100°4'. She lingered till November 1st. The prominent symptom clinically was ascites, and malignant disease of the stomach was not suspected, still less perforation. At the autopsy the hair was grey and the body was moderately fat. The abdominal cavity was distended with a collection of turbid fluid amounting to two hundred and sixty-two ounces. This had a neutral reaction with litmus paper. There was a large quantity of stringy lymph adherent to the coils of intestine and most abundant in the right and left iliac fossæ. The vermiform appendix was quite normal. The stomach was examined and the pyloric end was discovered to be adherent to the gall-bladder by recent lymph and when the adhesions were broken down a perforation was at once seen close to the pyloric ring large enough to admit the little finger. There were some old adhesions about the ring and in the corresponding part of the colon, the hepatic flexure that is. There was an oval ulcer about three quarters of an inch in its longest diameter which was obviously of cancerous nature. There was no direct extension by continuity of the gastric growth, "but I suppose," says Dr. Perry, "there can be little doubt that the ulcer in the colon was secondary to the ulcer in the stomach." The stomach itself was of ordinary size, neither large nor small, and its coats were not thickened. When it was opened there was an irregular ulcer at the pylorus encircling the organ and measuring one and three quarter inches at its widest part. The central part of it had quite the appearance of a simple gastric ulcer; but the edges were soft, raised, thick, and infiltrated with a white material which was clearly cancerous. It was certainly a tempting supposition that this was an instance of an ulcer become malignant. The small intestine was normal. The liver weighed thirty-nine ounces and was perhaps slightly cirrhotic. The bile flowed from the gall-bladder fairly easily into the duodenum. The pancreas was normal. The lymphatic glands showed no secondary deposit. The spleen weighed two and a half ounces and was normal. The kidneys were good organs. There were twenty-four ounces of serous fluid on the left and two on

the right side of the chest. There were signs of healed phthisis in both apices. Heart eight ounces and normal. Œdema of the epicardium. *See Insp.*, 1894, No. 423.

CASE 249. *Carcinoma of the pyloric end of the stomach. Secondary deposit in the liver and lymphatic glands.*—Thomas N., æt. 52, was admitted under Dr. Hale White on June 6th, 1894, for epigastric pain with attacks of vomiting since Easter, 1893. He died on December 20th, 1894. In hospital in previous September and again in February. Tumour palpable since February. The stomach has not been dilated. The tumour has increased in size; it moved with respiration and its position varied with the condition of the stomach contents. The patient has steadily emaciated and lately refused food. At the autopsy the hair was grey and the body was much emaciated. There was healed phthisis at both apices. The heart weighed eleven ounces, and the kidneys weighed thirteen ounces, were anæmic but otherwise normal. The wall of the stomach is stained reddish and there is an excess of mucus from catarrh. The pyloric portion for a distance of three inches is infiltrated with malignant growth. This extends completely round the viscus for the pyloric inch, but for the two inches towards the cardia there is a strip an inch wide at the greater curvature which has escaped invasion. The growth is sharply limited at the pylorus and at the edge towards the cardia there is an overhanging margin, and the mucous and submucous coats only are involved near the free margin. Elsewhere all the coats are involved so that the growth is an inch thick. The muscular coat is hypertrophied where only the superficial coats are involved. The growth near the pylorus is irregular and friable, ulcerating on the surface in a few places. In the middle of the surface of the growth it is smooth, and at the free portion is soft and ulcerating. Much of the growth is caseous on section and much very dense and fibroid. The pylorus is not contracted, admitting two or three fingers. The area of growth palpable below the liver measured three inches each way and consisted practically entirely of growth in the wall of the stomach. But upon raising the liver a mass of equal size but somewhat thicker was seen, involving the glands in the portal fissure. On section these showed suppuration and caseation. The growth appeared to have surrounded the branches of the portal vein, some of which were thrombosed, but the main trunk was patent. The liver showed a few secondary deposits. The gall-bladder was distended. The spleen weighed eight ounces. The supra-renal capsules were firm. There was growth in a gland at the head of the pancreas, the viscus itself was free from growth. Histological examination of the gastric growth showed the structure of spheroidal carcinoma with scanty stroma, but the secondary deposits in the liver were cylindrical carcinoma. *See Insp.*, 1894, No. 484.

CASE 250. *Carcinomatous ulcer on the greater curvature of the stomach. Invasion of liver. No gastric symptoms. Death from pyelo-nephritis secondary to enlarged prostate.*—Kenneth H., æt. 59, was admitted on December 31st, 1894, and died on January 12th, 1895, under Mr. Lucas. He came with enlargement of the prostate and ammoniacal urine. On admission there was œdema of the scrotum, and a reducible inguinal hernia on the right side. The bladder was washed out with Thompson's fluid. On January 9th his

mental faculties were noticed to be disordered, and he took very little to eat. On the 12th he died. At the autopsy the body was very thin, and the lungs deeply pigmented. There was much muco-pus in the smallest tubes. The heart weighed ten and half ounces, and there was a good deal of fat on the front of the right ventricle, more than from the thinness of the patient one would have expected, but in other respects there was nothing to note. The stomach was adherent to the under surface of the liver, and on opening it along the greater curvature there was found on its anterior surface, and two thirds of the distance towards the cardiac orifice, a circular ulcer three inches in diameter. The edges of the ulcer were soft, raised, and thick, being apparently infiltrated by malignant deposit, whilst the base was formed by the substance of the liver which was sloughy, brown and flocculent, or rather villous, apparently from digestion rather than growth. There had been no symptoms referred during life to gastric disease. There were old adhesions between the coils of intestine, and the mucous membrane was of a slaty colour, perhaps from the administration of mercury. The spleen weighed eight and half ounces. There was old and recent capsulitis, but otherwise the organ was normal. The lymphatic glands normal. Supra-renal capsules normal. The peritoneum showed some old adhesions. The kidneys weighed fourteen ounces, and were in a condition of pyelo-nephritis. The prostate was uniformly enlarged, and contained a small abscess. *See Insp.*, 1895, No. 16.

CASE 251. *Carcinoma of the pyloric end of the stomach. Secondary deposits in kidney, liver, lung and lymphatic glands. Gastro-jejunostomy ten months before death.*—Susan P., æt. 41, was admitted under Dr. Taylor on March 7th, and died on March 13th, 1895. Her illness began in the summer of 1892, with retching, severe abdominal pain, and pain in the small of the back. Three weeks afterwards vomiting began. In August, 1892, a small rounded tumour was felt in the umbilical region. In October, 1892, the patient suffered from hæmatemesis and melæna. She was admitted in October, 1893, for pain and tenderness of the abdomen and persistent vomiting. She was discharged on November 1st, 1893. She was re-admitted on April 24th, 1894, for similar symptoms, and on May 17th, 1894, Mr. Symonds performed gastro-jejunostomy. She was discharged on September 5th, relieved. Three weeks before her last admission, March, 1895, she had an attack of influenza, with pains all over her, and cough. Since then she has suffered from agonising pain. At the autopsy the body was wasted and the wall of the stomach was found to be very much thickened and infiltrated by a hard malignant growth extending from the pyloric ring five inches towards the cardiac orifice. The lumen of the pylorus was considerably narrowed and the mucous membrane in its immediate neighbourhood was ulcerated. On section, the wall of the stomach close to the pylorus was quite three-quarters of an inch in thickness, very hard and white. The mucous membrane of the rest of the stomach was red and congested and thrown into rugæ which were thickened and apparently also infiltrated with growth. Lying on and closely attached to the middle of the anterior surface just above the greater curvature was a loop of the first part of the jejunum forming a very sharp, V-shaped curve. On opening this up, the communication between the jejunum and stomach was shown, the lumen of the opening being quite three inches in circumference. The growth extended right up to

the right edge of the opening but had not involved it or the jejunum. "Judging from the condition of the stomach at the autopsy," says Dr. Bryant, "and the condition of the patient when the operation took place, I have no hesitation in saying that the operation must have been the means of prolonging her life quite nine months." The liver weighed ninety-two ounces and was hard and nodular, the nodules varying in size from a split pea to a shilling. They were slightly raised above the surface but some of them showed well-marked umbilication. On section the organ was seen to be much infiltrated with masses of secondary growth of a curious semi-translucent appearance many of which showed degeneration and breaking down in their centres. The lymphatic glands were enlarged from a deposit of growth and fifty-three ounces of clear serous fluid were found in the peritoneal cavity. The gall-bladder, pancreas, spleen (eight ounces) were normal. Supra-renal capsules also normal. The kidneys showed one secondary nodule of growth about the size of a split pea in the right kidney; and there was a pedunculated polypus about the size of a pea attached to the external os. The bladder, vagina and tubes were normal. There were few filamentous adhesions on the surface of the lower lobe of the left lung. The bronchial glands were enlarged and infiltrated with secondary carcinomatous deposit. There were several nodules of growth in both lungs: in most cases, however, near the root of the lung and in the neighbourhood of the larger bronchi. In the right lower lobe there was a patch of semi-solid lung about three inches in diameter which on section appeared to be streaked with greyish white lines due no doubt to infiltration with secondary growth. The trachea and bronchi were normal. The heart weighed ten ounces and was pale. There was no valvular disease. See *Insp.* 1895, No. 77.

CASE 252. *Carcinoma of the pylorus and lesser curvature of stomach. Secondary deposits in liver. Gastro-jejunostomy.*—Albert H., æt. 41, was admitted under Dr. Goodhart, on March 22nd, 1895, and died on April 7th, 1895, for dyspepsia and abdominal tumour. For the last four years the patient has suffered from indigestion, gradually becoming worse. Ten weeks previous to admission the pain and discomfort became more severe. A lump was found in the region of the stomach. He had not been sick until sixteen days before admission, when he lost about one pint of blood. Has lost flesh greatly. Three months before admission the lump increased very much in size, and became very tender. Just before admission he was very sick. No blood. On admission he was much wasted, and there was a well-marked swelling occupying the right hypochondriac, epigastric and umbilical regions. On March 27th he vomited a pint and half of matter, black and sooty in character. He was much relieved, and the tumour seemed smaller afterwards. On the 28th he again vomited, and all food by the mouth was stopped. On April 3rd, vomiting continues, though the patient has had no food by mouth for several days. On April 6th Mr. Symonds performed gastro-jejunostomy. A large mass of growth was felt at the pyloric end of the stomach. The operation lasted one hour and thirty-five minutes. Immediately after the operation the patient was much collapsed, but recovered from this. He again became collapsed on the following day, and died at 4 a.m. At the autopsy, on opening the abdomen, it was found that the inner aspect of the peritoneum appeared quite normal. The jejunum was

already united to the stomach wall by a layer of recent lymph around the edges of the wound, and there were no signs of leakage. A large mass of growth was found involving the pyloric region of the stomach. The growth was adherent to the under surface of the liver, just external to the gall-bladder, by old and firm strata of fibrous tissue which had to be cut through to separate them. It was also firmly adherent to the anterior surface of the head of the pancreas, which, however, itself was not involved. The transverse colon was also firmly united to the stomach and pancreas. After separating the stomach from adhesions, it was opened along the greater curvature and above the artificial opening until the pylorus was reached. The little finger could be introduced through the pylorus with ease. On cutting through the pylorus there was seen to be an ulcer involving this region, sharply defined towards the duodenum, and extending in the opposite direction for an inch and half along the lesser curvature. The edges were sinuous, thickened and irregularly nodulated. The floor of the ulcer was ragged and sloughy in parts, especially the end nearest the pylorus. It was also very foul-smelling. The ulcer at its broadest part measured an inch and half in diameter. The coats of the stomach in this region, and especially around the pylorus, were much thickened, and the characteristic differentiation was very distinct. No evidence of old simple ulcer. The stomach itself was not dilated, nor were the walls of the remainder of the stomach thicker than usual. The artificial opening into the jejunum was round, and allowed the passage of the little finger through it. The point of the opening in the jejunum was situated twenty-three inches below the pylorus. The edge of it was one and three-quarter inches behind the extending edge of the ulcer in the stomach. The liver weighed forty-four ounces, and contained numerous secondary deposits, most of them umbilicated, and very hard on section. There were old adhesions of the pleura, and the lungs were slightly emphysematous with some posterior collapse. The heart weighed nine ounces, and the pericardium contained about a drachm of clear serous fluid. There were no deposits in the mediastinal or mesenteric glands. The kidneys weighed ten ounces, and were tough from chronic congestion. The gall-bladder was normal. The spleen weighed four ounces. Microscopically the growth was a spheroidal carcinoma with abundant stroma, the structure consisting of alveoli filled with large epithelial cells, with well marked nuclei, the cells varying much in size and shape. *See Insp.*, 1895, No. 111.

CASE 253. *Carcinomatous infiltration of the stomach. Secondary deposits in peritoneum and lymphatic glands. Hydronephrosis.*—James L., æt. 60, was admitted under Dr. Pye-Smith on April 9th, for epigastric pain and hæmatemesis. He died on April 11th. He has been ill since January with severe abdominal pain and vomiting after food. Has rapidly emaciated and the vomit has been coffee-coloured for a fortnight. There was a firm, hard mass which moved with respiration palpable in the left hypochondriac region which it was thought might be the spleen. At the autopsy the body was much emaciated and weighed six stone five pounds. The cervical and thoracic glands were free from secondary deposit. The lungs emphysematous and œdematous. The heart weighed twelve ounces, there being slight hypertrophy of the right ventricle. The œsophagus, especially in the lower part, had lost the epithelium, except in certain areas, from post-mortem digestion.

The stomach was contracted owing to the diffuse infiltration of growth which formed a sort of cuirasse. There were two outlying growths, the former of which was soft and had evidently oozed blood, and projected as a raised mass of growth. This was soft while the diffused growth was hard, "yet I am inclined to think," says Dr. Pitt, "from the appearance that the soft growth was the primary one. There can, I think, be little doubt that at any rate the primary growth was gastric." The growth had run along the omentum, which had shrunk up into an indurated mass. A similar contracting and indurating infiltration had involved the mesentery and meso-colon, with the result that the intestines were held back to the spine and peristalsis must have been greatly interfered with. A coil of ileum was bound down tightly to the pelvis. The greater part of the ileum was empty and contracted. The growth ran as a dense mass along the aorta in the glands. The glands of the transverse fissure of the liver were involved. The growth did not show degenerate and caseous changes but tended to be dense and fibroid. There were numerous minute nodules of growth on the peritoneal surface and the serous coat had lost its lustre. There were about four ounces of light brown serous fluid in the peritoneal cavity. The liver was normal. The bile-duct dilated but the gall-bladder not greatly distended. The common duct was surrounded by growth but not obviously compressed. There was no jaundice. The gall-bladder was normal except for two minute nodules on the peritoneal surface. The pancreas was surrounded by growth but not infiltrated. The spleen was normal, weighing three ounces. The growth in the stomach extended to within an inch and three quarters of the pylorus, the main mass measuring five inches in circumference and two across. The separate nodules were an inch long and half an inch across. Adhesions had constricted the hepatic flexure of the colon and also the third part of the duodenum. One of the supra-renal capsules was surrounded and at one spot apparently infiltrated by growth. The kidneys were hydro-nephrotic. Microscopically the growth was a cylindrical carcinoma with a considerable amount of stroma. *See Insp.*, 1895, No. 115.

CASE 254. *Carcinoma of the stomach. Profound anæmia. Sclerotic changes in spinal chord.*—Robert L., æt. 50, was admitted under Dr. Goodhart on February 25th for diarrhoea and weakness, and died on May 21st, 1895. He had severe vomiting after influenza two and a half years ago, and diarrhoea six or seven times daily. When admitted he was in a profoundly anæmic condition, the hæmaglobin being only fifteen per cent. The diarrhoea and vomiting increased. He died with rapid failure of heart and respiration. At the autopsy there was œdema of the connective tissue of the back and buttocks, but not definitely so in the lower extremities. The spinal cord was carefully examined by Dr. Pitt and found to present irregular degenerative sclerotic changes in the posterior columns, regarded by him as due to anæmia. There were thirty-one ounces of serous fluid in the right, and thirteen ounces in the left pleura, and there was some œdema of the larynx. The lungs were also œdematous. The pericardium contained four ounces of serum. The heart weighed eleven ounces but was not obviously fatty. The abdominal aorta was decidedly atheromatous. The stomach presented on its anterior surface near the lesser curvature, a small carcinomatous growth, raised, not ulcerated, with a nodular surface and nowhere more than half an inch thick.

It lies three inches from the pylorus and measures one and three-quarter inches by one and a half inches. "It is difficult to see," says Dr. Pitt, "such a small growth and to conclude that it can have been growing for more than three or four months. The history points to attacks of vomiting and anæmia for the greater part of two years." The rest of the intestine was normal. The abdomen contained thirty-two ounces of serous fluid. The liver weighed sixty-nine ounces and was anæmic and contained an excess of iron. The gall-bladder was full of dark bile. The spleen weighed nine ounces and was firm and gave hardly any blue stain for ferric salt. The kidneys were profoundly anæmic and presented two fibromata with some adherent supra-renal tissue. There were also some scars from old infarction. Histologically the nodule in the stomach is stated by Dr. Pitt to consist of a carcinomatous infiltration of the lymphatics in the deeper coats. See *Insp.*, 1895, No. 162.

CASE 255. *Carcinoma of the lesser curvature of the stomach. Secondary growth in the liver. Portal thrombosis.*—Henry J., was admitted for abdominal pain under Dr. Pye-Smith on June 22nd, 1895, and died on July 8th, 1895. The patient had had gout for twenty-five years. His present illness began six weeks ago with pain in the epigastric region and loss of appetite. There had been no hæmatemesis. On admission there was œdema of the legs with general abdominal distension. There was some small amount of fluid in the peritoneal cavity. The patient was jaundiced. The edge of the liver was felt half an inch below the ribs. The liver dulness extended five and three quarter inches vertically. There was dulness and deficient tactile vocal fremitus over the right base behind, below the angle of the scapula. Pleuritic rub at upper margin of dulness. June 29th, liver dulness increased, extending to within one inch of the umbilicus in the middle line. July 3rd, a large lump felt on the surface of the liver. July 6th, patient aspirated and fifteen ounces of bloody serum withdrawn. At the autopsy there were deposits of urates in the great toe joint and adhesions over the lower lobe of the right lung. Both lungs were œdematous and the lower part of both sides was in a condition of hypostatic pneumonia. There were no secondary deposits in the thoracic glands. The heart weighed nine ounces and there was a considerable deposit of fat on the surface of the right ventricle with fatty infiltration of the muscular coat. When the abdomen was opened the stomach was found to be adherent to the under surface of the liver, to the omentum and transverse meso-colon and to the pancreas. On opening the viscus an irregular nodulated growth was seen, ulcerated on the surface, spreading on the lesser curvature in all directions, reaching to within one inch of the pylorus and to within one inch of the cardiac extremity, and extending thence on both walls of the organ. The growth measured five inches by five inches. The walls of the stomach over this area were infiltrated by growth, apparently extending into the submucous layer. The muscular coat also appeared hypertrophied. The pyloric orifice was free. No secondary deposits on the surface except over the area occupied by the growth. The stomach wall was normal. The rest of the intestinal canal was also normal. The peritoneum contained seventy-six ounces of blood-stained fluid and the liver weighed one hundred and eleven ounces, was irregular in shape and very soft to the touch. On section it was infiltrated in all directions by a very soft growth which could be with ease squeezed out of it and appeared just like

brain substance. The portal veins contained ante-mortem thrombus spreading into the mesenteric branches. The gall-bladder, pancreas and glands were normal. The spleen weighed two ounces and was soft. The kidneys were normal. On histological examination the growth proved to be a spheroidal carcinoma with scanty stroma. *See Insp.*, 1895, No. 231.

CASE 256. *Carcinoma of pylorus. Secondary deposits in lymphatic glands. Death from injury.*—The case of a man named Wood, who was brought dead into the Hospital; said to have jumped off London Bridge. At the autopsy there were fractures of the skull, ribs, femora, and laceration of the lungs. The stomach was moderately dilated. There was a new growth at the pyloric end constricting the calibre, and the little finger could be passed through it. The growth was situated in the submucous tissue, and projected into the cavity of the organ as a lobulated mass involving the entire circumference. The mucous surface was not ulcerated, and the serous surface was not invaded. It ended sharply at the duodenal end of the pylorus. There were a few small hard glands in the omenta close by. Otherwise no secondary deposits were found anywhere. The pancreas was normal, but there was some hæmorrhage at the head reaching into the portal fissure. The liver weighed thirty-four ounces. The kidneys were normal. *See Insp.*, 1895, No. 291.

CASE 257. *Carcinoma of the cardiac orifice of the stomach and lower end of the œsophagus. Secondary deposits in brain, liver, lungs, pleura, and lymphatic glands.*—William McK., æt. 61, was admitted for aphasia and right hæmiplegia, under Dr. Perry on October 7th, and died on October 13th, 1895. In the middle of last August he had twitchings of the right arm beginning in the thumb, and several subsequent attacks of a similar kind. At the beginning of September there were convulsive movements of the right arm and right side of the mouth followed by loss of power of speech for one day. On October 4th another attack and the patient has not been able to speak or use his right arm or leg since. On admission complete paralysis of the right arm and leg and of some of the facial muscles connected with the right side of the mouth. Incontinence of urine and fæces. Recognises objects but cannot name them, although he can repeat the name when told it. There is complete anæsthesia on the right side, except of the sense of heat. October 10th, very drowsy. October 11th, vomiting set in. 13th, remained the same until 4 a.m. when his pulse suddenly became weak and irregular and he died at 4.30. At the autopsy the brain weighed forty-seven ounces, and there was a firm grey tumour in the left cerebral hemisphere measuring one and a half inches by one and a quarter inches by one inch, situated just below the cortical grey matter. The tumour did not involve the internal capsule. It was just above and a little behind it and external to it. The anterior extremity did not extend beyond the fissure of Rolando. On the cortex the tumour corresponded to the upper part of the ascending parietal and superior parietal convolutions. There was a small hæmorrhage, about half a drachm of blood, between the anterior border and the adjacent white matter. The tumour could be enucleated with ease being much harder than the brain tissue, in fact it was much harder and firmer than normal liver. There was no softening. Both internal capsules quite normal. There was no descending degeneration visible.

The cervical glands were large, hard, and infiltrated with secondary deposits, and there were secondary deposits in the pleura. The pleura of the left lower lobe was thickened and the lung in this neighbourhood fibroid and presenting dilated bronchial tubes. Both lungs were œdematous. There were several secondary nodules of growth on the right lung. The bronchial tubes contained muco-pus. The bronchial glands were not enlarged. The posterior surface of the pericardial sac was adherent to the œsophageal growth, and there were several large nodules of growth bulging forward the pericardium. The parietal layer of the pericardium was not, however, actually involved. The heart weighed ten ounces, and was free from deposit. The valves were practically healthy. The lower four inches of the œsophagus, and the upper three inches of the cardiac end of the stomach were infiltrated with a thick, hard, new growth, the inner surface of which had broken down, especially in the lower part of the œsophagus, forming a ragged-walled cavity which contained foul-smelling blood-clot. On each side the growth was firmly adherent to the lung and had infiltrated the lower lobe. Anteriorly it had become adherent to the posterior surface of the pericardial sac and had bulged forward in places, but had not actually involved the serous membrane lining it. In the stomach the growth was thicker, nodulated, and not so much ulcerated. The lumen of the œsophagus was not stenosed, nor was the cardiac orifice of the stomach. There were secondary deposits in the liver and in the head of the pancreas. The lymphatic glands surrounding the pancreas were considerably enlarged by malignant growth. *See Insp.*, 1895, No. 392.

CASE 258. *Carcinoma of the pyloric end of the stomach. Secondary growth in the liver, invading the duodenum, colon and gall bladder.*—Mary B., æt. 54, was admitted for abdominal pain and vomiting under Dr. Pye-Smith on October 8th, 1895, and died on October 20th. Two months ago she began to suffer from flatulence with pain in the epigastrium after eating, and she noticed a hard swelling which increased in size. She lost her appetite and wasted a good deal. Attended Out-patients with benefit for a month. Three weeks ago the symptoms increased and vomiting came on, the vomiting occurring two hours after eating. On admission she was not emaciated. The skin was sallow. The abdomen was distended on the right side and there was a large, doughy, spherical tumour around the umbilicus, about the size of a tennis ball. This tumour had been present for fourteen years. In the right hypochondrium were three prominent nodules, stony hard, and projecting from the surface of the liver, which was very large. No umbilication detected. The extent of the liver dulness in the nipple line, ten inches. Constipation. On October 14th, bowels open six times. The liver gradually increased in size and the nodules became more prominent. The patient sank and died suddenly on the 20th. At the autopsy the body was fairly nourished, the thyroid gland large, containing a multilocular cyst in the right lobe. The lungs œdematous and some few patches of broncho-pneumonia in the lower lobe. There was ante-mortem thrombus in many branches of the pulmonary artery in the right lower lobe. The bronchial glands were enlarged. The heart weighed eleven ounces, and there was some fatty degeneration of the muscle of the right ventricle. The stomach was dilated and contained a thick brownish fluid which appeared to be mostly altered blood. About three-quarters of an inch above the pyloric ring on the posterior surface

of the stomach there was a circular malignant growth about two inches in diameter, the edge of which was raised about three-eighths of an inch above the surrounding mucous membrane. The centre was depressed and ulcerated so that the growth had a cup-shaped appearance. In colour it was a pinkish-yellow and it looked very much like a sea-anemone both in shape, colour, and general appearance. The anterior and superior surfaces of the pyloric end of the stomach were adherent to the liver as also were the first part of the duodenum and the hepatic flexure and the first part of the transverse colon. In fact there was a general matting together of these structures. The liver was very much enlarged and the right lobe contained huge secondary masses of growth, three of which projected from the anterior surface and had been felt during life. The contents of the growth were very soft in the centre, and on the under surface of the liver was a very large mass of secondary growth which had extended to and infiltrated the first part of the duodenum, destroying a considerable extent of its wall, and similarly affecting an adjacent portion of colon. In the gall-bladder five large stones were found. The right side of the wall of the gall-bladder was infiltrated with a soft, projecting, ragged growth, and this growth communicated with the cavity which opened into the duodenum. The liver substance which was not affected by growth gave a lardaceous reaction with iodine. The primary growth was in the stomach, the secondary in the liver from whence it had invaded the duodenum, colon and gall-bladder. See *Insp.*, 1895, No. 403.

CASE 259. *Early carcinoma of lesser curvature of stomach. Death from pyelo-nephritis following enlarged prostate.*—Robert C., æt. 71, was admitted under Mr. Dunn on January 23rd, for enlargement of the prostate, and died on February 6th. At the autopsy an abscess was found in the prostate with cystitis, and ascending nephritis. As regards the stomach, it was found that on the lesser curvature there was a raised, white, firm patch about one and half inches in diameter, which was adherent to the muscular coat, "and was no doubt," says Dr. Perry, "a cancer in an early stage before ulceration had begun." In other respects, the stomach was normal. The patch did not exceed a line in thickness, excluding the muscular coats of the organ. Histologically, the deposit proved to be a cylindrical-celled carcinoma. There were no secondary deposits. See *Insp.*, 1896, No. 43.

CASE 260. *Carcinoma of the pyloric end of the stomach. Secondary deposits in liver, supra-renal capsule and lymphatic glands.*—Benjamin D., æt. 47, was admitted under Dr. Perry. He had a hard, nodular, irregular liver reaching to the umbilicus. The growth steadily increased, and on February 3rd he became jaundiced. He died on February 12th, and at the autopsy the stomach was found not to be dilated, the walls being very thin. There was a malignant ulcerating surface one and half inches across, and two and half inches from the pylorus, which reaches up to and spreads half an inch into the duodenum. There is very little fungating growth on the mucous surface, the ulcerating area not being much raised. There are several small, discrete nodules adjacent. "The most remarkable feature about the growth," says Dr. Pitt, "is the presence of a large mass of nodular growth extending five inches along the serous surface, and more than one

and a half inches thick." There are also several glands adjacent which are infiltrated with growth. The liver weighs one hundred and twenty-seven ounces, and contains a large number of nodules of growth. One large mass, three inches across, is situated on the under surface of the liver, and over this the common bile-duct is stretched. Hence the jaundice. Several mesenteric glands contain caseating deposits of growth, and there is a nodule in one of the adrenal bodies. The heart weighs seven ounces, and is much wasted. The kidneys are bile-stained, weighing eleven ounces. Histologically, the growth is a cylindrical carcinoma. *See Insp.*, 1896, No. 51.

CASE 261. *Carcinomatous ulcer of the pylorus. Secondary deposits in liver and lymphatic glands. Hæmorrhagic enteritis. Thrombosis of portal vein in the liver.*—William S., æt. 36, was admitted with enlargement of the liver under Mr. Golding-Bird on May 14th, 1896, and died on May 17th. His grandmother and mother died of cancer. He had been losing flesh for six months. The liver is much enlarged and its surface irregular. The patient is in a very weak state and on the night of the 17th he was very sick, the vomiting continuing till his death and contributing to it. At the autopsy the body was sallow and wasted. There were no secondary deposits in the thoracic viscera. The heart weighed nine ounces. The stomach was normal in size and shape but at the pyloric end there was a carcinomatous ulcer, which, when the stomach was laid open, proved to be an encircling ulcer having a somewhat irregular, raised, white margin towards the body of the stomach and closely limited by the pyloric ring where its edge was of a similar character. Its breadth transversely was about an inch to one and a half inches. The base of the ulcer was formed by the muscular coat of the viscus, and though the nature of it was quite clear from the look of its edges, it was a case in which, from the absence of any bold masses or exuberance of sprouting, the words might be applied that "it had ulcerated rather than that it had grown." Histologically the growth was a spheroidal-celled carcinoma. The intestines, both large and small, contained much blood which did not appear to have come from the ulcer in the stomach, for no truncated vessels were to be seen, but from the mucous membrane of the gut, which, beginning twenty inches from the commencement of the jejunum was for a length of four feet intensely congested with submucous hæmorrhage and thickening, in fact in a state of acute enteritis. Histologically the appearances were in accordance with this diagnosis, the vessels being dilated and there being numerous small cells in the glands and submucous tissue. The peritoneal cavity contained fifty-four ounces of blood-stained fluid. The liver was enormous, weighing one hundred and seventy-six ounces. It was irregular in shape but about five-sixths of it was composed of growth occurring for the most part in large globular masses, some embedded in, and some projecting from the surface of, the organ. On section the growth was soft, white, and in the more central parts of the larger masses caseating and yellowish. There was cancerous thrombus in the trunk and many of the branches of the portal vein in the liver. There were secondary deposits in the glands along the lesser curvature and around the pancreas. The spleen weighed four ounces and was normal. The kidneys weighed ten ounces and were hard and congested. *See Insp.*, 1896, No. 181.

CASE 262. *Carcinomatous ulceration and infiltration of pylorus. Perforation and peritonitis. Secondary growth in rectum and ovary. Colotomy.*—Sarah B., æt. 40, was admitted for growth in the rectum, under Mr. Dunn, on June 6th, 1896, and died on June 28th. Six years ago she had bronchitis and liver trouble; since then indigestion. Last summer could not take solid food, and so lived chiefly on stimulants. Diarrhœa for three weeks. Last year diarrhœa with a passage of blood and mucus. On admission the patient was noticed to be thin and ill. The bowels were constipated, the appetite poor, and she had vomiting with abdominal pain. There was a constant discharge from the rectum. A growth was felt per rectum attached to the sacrum. A large, hard mass was also felt in the right iliac fossa. On June 10th, the first stage of inguinal colotomy was performed, two or three pints of pale yellow fluid escaping from the peritoneal cavity. On June 12th, the abdomen was much distended. On the 26th, the temperature rose to 100·8°, later to 103°, and the patient died on the 28th. At the autopsy the inguinal colotomy wound was found in a healthy condition. There was firm attachment of the gut to the abdominal parietes, and Dr. Bryant was of the opinion that the peritonitis had no connection with the operation. The peritoneal cavity contained between seventy and eighty ounces of fluid, having a deep yellow colour, and containing a large quantity of pus. The spleen weighed seven ounces, and was soft. The gall-bladder contained four faceted gall-stones. The stomach was enlarged, and the walls were much thickened, especially towards the pylorus. The pylorus was much thickened, and very hard. The pyloric orifice was somewhat stenosed, only admitting the little finger with difficulty. Just above the pyloric ring the stomach wall was one inch in thickness. The increase in size appeared to be chiefly in the submucous coat, which was hard, and of a semi-translucent appearance. The mucous membrane showed no sign of breaking down, or of recent ulceration, but on the lesser curvature, about one and a half inches above the pyloric ring, and just above the thickest portion, was a kind of pouch in which the mucous membrane was absent, having the appearance of a healed gastric ulcer. In this position the stomach wall was exceedingly thin, and on looking at the peritoneal surface which corresponded there were signs of recent peritonitis, and a minute perforation was discovered which was probably the cause of the peritonitis. The small intestine was healthy. The rectum was much thickened, and this appeared to be due to an increase of the submucosa, which was rather hard, and of a semi-translucent, gelatinous appearance. Three inches above the anus, where the thickening was greatest, there was a sharp kink in the wall of the gut. The mucous membrane was not ulcerated, and Dr. Bryant remarks, "This condition seems to be due to some form of hypertrophy rather than to a malignant growth." The right ovary was enlarged, so as to be of the size of a small cocoa-nut. It felt very hard in places, and in others was very soft and viscid. On section, too, it was hard; and the cut surface was of a pale yellowish colour. It contained several cysts. The left ovary, which was of the size of a small egg, was in a similar condition, the vagina and uterus being healthy. Histological examination of the rectum, stomach, and ovary, shewed chiefly fibrous tissue, but there were also small groups of medium-sized, round, epithelial cells arranged in small irregular spaces between the fibrous tissue. The epithelial cells were most abundant in the section of the ovary. See *Insp.*, 1896, No. 253.

CASE 263. *Carcinoma of the pyloric half of the stomach. Secondary deposits in mesentery. Chronic peritonitis.*—George S., æt. 65, was admitted for vomiting and abdominal pain on July 10th, 1896, under Dr. Taylor, and died on July 27th. A year ago the patient suffered from vomiting after food and was treated by a doctor. Sixteen weeks ago he took to his bed and had severe griping pains in his abdomen which were relieved after defæcation. He has lately suffered from alternating constipation and diarrhœa. Circulatory and respiratory systems normal. Alimentary system, impaired resonance between umbilicus and epigastric angle with well-marked resistance. Peristalsis visible. Succussion splash obtained. Nodule felt between bladder and rectum. July 15th, vomiting and abdominal pain. 22nd, vomit contains bile. 27th, gradually became weaker and died at 4.15 a.m. At the autopsy the body was much emaciated. The right lung was firmly adherent to the thorax, the pleura being thickened and adherent. There was a small patch of healed phthisis at the right apex. In the left lung were signs of old pleurisy and the left upper lobe was a little thickened and adherent. There were several patches of broncho-pneumonia in the posterior third of the left lower lobe and in the left upper lobe. There was a little serous fluid in the pericardial sac and the heart weighed eight ounces. The pyloric half of the stomach was occupied by a firm, tubular growth, the stomach being firmly adherent to the adjacent organs. The growth did not cause much obstruction. There was considerable thickening of the muscular coats, and of the submucous coat in particular. The wall in the thickest part measured about three eighths of an inch. It was very hard. Below it was sharply limited by the pyloric ring. Above it gradually shaded off into normal stomach tissue. The thickest part of the growth was about one and a half inches from the pylorus. It also seemed firmer and more fibroid here and there was more loss of mucous membrane. In fact at this particular spot in the smaller curvature the mucous surface had very much the appearance of a cicatrised gastric ulcer. The mucous membrane was certainly very deficient in the lower part of the affected area. There was no deep ulceration. The cardiac half of the stomach was somewhat dilated. The intestines were firmly matted together, the mesentery being thickened and shortened by carcinomatous infiltration. The liver weighed thirty-four ounces and was small and was adherent to adjacent parts but contained no secondary deposits. The gall-bladder and pancreas were normal. Lymphatic glands enlarged. Spleen ten and a half ounces, firmly adherent to adjacent structures. Supra-renal capsules normal. Kidneys healthy. No nodule of any kind could be felt between the bladder and rectum. The prostate was its usual size. See *Insp.*, 1896, No. 310.

CASE 264. *Carcinoma of the pyloric end of the stomach. Secondary growths in pancreas and lymphatic glands. Gastro-jejunostomy.*—John H., æt. 49, was admitted for abdominal pain and vomiting under Dr. Goodhart on June 29th, 1896, and died on August 3rd. The patient began to suffer from dyspepsia two years ago and from vomiting one year ago, but this only after solid food. The vomiting commenced two hours after the food had been eaten. Pain in the abdomen, dull and aching. Has lost weight greatly. On admission the abdomen is somewhat full on the right side and a round mass can be felt in the right epigastric region which is freely movable. The liver is

enlarged and there is a succussion splash over the stomach. July 20th, vomiting severe. July 26th and 27th, pain also severe. July 30th, gastro-jejunostomy performed. The patient seemed to recover well from the operation but gradually sank on August 3rd. At the autopsy the body was found to be much wasted and the lungs, which were œdematous, shewed hypostatic pneumonia in the lower lobes. The heart weighed eleven and a half ounces and was normal. The aorta was atheromatous. The pyloric end of the stomach was involved in a large mass of growth the size of a large orange. The stomach itself much dilated. The growth was ulcerated on the inner surface, the base of the ulcer being very irregular whilst its edges were rounded and much thickened. The ulcer was sharply limited on the duodenal side by the margin of the pylorus, but spread out towards the other extremity on both the anterior and posterior surfaces of the stomach. The lymphatic glands, and head of the pancreas, were involved by extension of growth, and in the portal fissure several of the glands contained secondary deposits. The ulcerated surface of the growth measured two and three-quarter inches in both directions. On the anterior surface of the stomach a loop of the jejunum was firmly attached by recent adhesions, this part being exactly eighteen inches below the pylorus. The Murphy's button was still firmly fixed in position and the orifice patent. There was no peritonitis nor any kinking of the bowel. The rest of the alimentary canal was normal. The liver weighed sixty-four ounces and was normal. The gall-bladder and pancreas were normal. The spleen weighed ten and a half ounces and shewed old capsulitis. The supra-renal capsules and kidneys normal. Histologically the growth was a cylindrical carcinoma, but many of the alveoli which were lined with columnar epithelial cells were filled with cells of various shapes. There was a considerable number of inflammatory cells invading the muscular coats. *See Insp.*, 1896, No. 318.

CASE 265. *Carcinoma of the pylorus. Secondary deposits in liver, pancreas and lymphatic glands.* Philip N., æt. 49, was admitted for abdominal pains and vomiting under Dr. Pye-Smith on July 7th, 1896, and died on August 4th. Eighteen months ago he suffered with rheumatism, and a year ago with pain in the loins. Since this time the pain has been of a gnawing character. Fourteen days previous to admission had abdominal pain with diarrhoea and vomiting, the latter persisting. On admission he was a strong and well-nourished man, slightly jaundiced all over. The liver dulness extended to the level of the umbilicus and upwards as far as the seventh rib in the nipple line on the left side. Two enlargements on the surface of the liver, one to the left and the other to the right side of and above the umbilicus. At the lower edge of the liver and just to the right side of the umbilicus was a globular, soft tumour thought to be the gall-bladder. The urine contained a trace of albumen and some bile-pigment. July 10th: A hard mass was noticed in the left lumbar region which moves its position. 18th: He is much more jaundiced. 24th: Numbers of irregular small prominences noted on the anterior surface of the liver; losing weight. July 30th: Noted to be still more emaciated; gradually becoming very drowsy. At the autopsy there was a small deposit of urate of soda in the right great-toe joint, and old pleuritic adhesions over the left lung. The thoracic glands were normal. At the apex of the upper lobe, which was

firmly adherent to the parietal pleura, there was a cavity the size of a shilling. Both lungs were oedematous with numerous patches of broncho-pneumonia scattered through them, some already commencing to break down, giving rise to a dirty white fluid. The heart weighed nine ounces. The pyloric extremity of the stomach was involved in a large mass of growth measuring on section three and a half by three inches. The pylorus was partly obstructed by it. The stomach itself was dilated to about twice its usual size. The inner surface of the growth was ulcerated, the edges being irregular and very thickened and rounded. The growth was distinctly limited towards the pyloric extremity but was spreading out along the lesser curvature and on the neighbouring posterior and anterior surface of the stomach in the opposite direction. The growth had involved the neighbouring tissues, the head of the pancreas and the lymphatic glands, and somewhat obstructed the common bile-duct just above its opening into the duodenum. The gall-bladder, cystic, and hepatic ducts were much distended with a dark green, viscid bile. The gall-bladder corresponded in position to the tumour felt during life and thought to be such, projecting about an inch below the free edge of the liver. The liver weighed one hundred and two ounces, and was covered with numerous secondary deposits, some breaking down in the centre. These varied in size from a pea to a half-crown piece. The tissue was deeply tinged with bile. The intestines were normal. The spleen weighed three ounces, and shewed old capsulitis. The supra-renal capsules were normal. The growth was a spheroidal carcinoma with scanty stroma. *See Insp.*, 1896, No. 321.

CASE 266. *Early carcinoma of the lesser curvature of the stomach. Death from ulcerative endocarditis.*—Alfred P., æt. 24, was admitted for a popliteal aneurysm, under Mr. Golding-Bird, on July 23rd, 1896, and died on August 2nd. The patient became hemiplegic. At the autopsy he was found to be suffering from septic endocarditis due to streptococci. On the lesser curvature, close to the pylorus, was a rounded plaque about as big as a shilling, about an eighth of an inch in thickness, white and covered with mucous membrane. It was firmly adherent to the muscular coat, and could not be moved over the submucosa or muscularis. "Its nature is somewhat doubtful," says Dr. Perry, "but I think it was an early carcinoma." *See Insp.*, 1896, No. 325.

No. 267. *Carcinomatous stenosis of the cardiac orifice of the stomach. Secondary deposit in the œsophagus and in the peritoneum. Gastrostomy.*—Thomas H., æt. 57, was admitted for dysphagia, under Dr. Pye-Smith on June 27th, 1896, and died on September 5th. The patient first had difficulty in swallowing last March, and since then the difficulty has gradually increased. He has lost two stone six pounds in weight since that time. On admission he was wasted, with a retracted abdomen and increased sense of resistance and pulsation about the umbilicus. There was a systolic bruit at the apex. The lungs were healthy. On July 14th a fine bougie was passed and met with resistance and caused pain in the epigastrium, suggesting disease of the cardiac end of the œsophagus. On July 7th gastrostomy was performed by Mr. Jacobson. July 10th, the tube being blocked, Mr. Jacobson opened the stomach with tenotomy knife and inserted a No. 6 catheter. July 13th, tube

escaped from stomach. August 5th, the patient weighed seven stone one pound. August 25th, patient holding his own. Tube increased in size to three eighths of an inch in diameter. September 3rd, patient getting weaker. Eczema of the abdominal wall round the operation wound. He gradually sank and died on September 5th. At the autopsy the body was much wasted and the gastrostomy wound in the epigastric region showed a raw condition of the skin around it. There was old pleurisy on the right side and the lobes of the right lung were adherent to each other. Healed phthisis at the right apex, this part of the lung being in a fibroid condition and containing some calcareous nodules. There was a similar condition at the left apex and in addition some small, round patches of caseation. Both lungs œdematous. The heart weighed nine ounces and there was œdema of the pericardium over the right ventricle. Mitral valve thickened. Coronary arteries atheromatous. Some patches of fibroid degeneration in the muscoli papillares of the left ventricle and in the muscle forming the apex of the left ventricle. Patches of early atheroma in the aorta. There was a large mass of hard, malignant growth in the stomach at the cardiac end. The œsophagus above the diaphragm was not directly affected by the growth, but there was a long secondary deposit in the wall of the organ not entirely surrounding it and not sufficient to cause the œsophageal obstruction. The cardiac orifice of the stomach, however, was very much stenosed and would only admit a very small catheter. The growth on section was very nearly an inch in thickness. On opening the stomach on the posterior surface the growth projected into the cavity of the stomach and its surface was ulcerated. It was hard and the diagram showed it to be a growth encircling the cardiac end of the stomach and extending on both walls of the stomach a distance of about one or two inches. The stomach was adherent to the diaphragm and liver. There were numerous small nodules of growth in the peritoneum. The mesentery was generally infiltrated with growth. It was short, thick and very tough. The liver weighed fifty-two ounces and contained no secondary deposits. The mesenteric glands were enlarged with deposits of secondary growth. The gall-bladder, spleen and supra-renal capsules were normal. The kidneys were healthy. Microscopical examination showed the growth to be a spheroidal-celled carcinoma. *See Insp.*, 1896, No. 367.

CASE 268. *General carcinomatous infiltration of the stomach. Extensive sloughing. Invasion and necrosis of the liver. Secondary deposits in liver.*—Elizabeth K., æt. 36, was admitted with an abdominal tumour, under Dr. Pitt, on September 21st, 1896, and died on November 24th. The patient has suffered from abdominal pain with vomiting after meals for the last four years. On admission there was a definite tumour palpable between the umbilicus and the costal margin. The vomit contained no hydrochloric acid. The patient remained in much the same condition till October 15th, when she commenced to have attacks of diarrhœa and vomiting, which continued at intervals. There was more or less pyrexia since admission. At the autopsy the body was extremely emaciated, the lungs were small, and the heart, which weighed six and half ounces, was wasted. The abdomen, when opened, shewed that a large mass in the wall of the stomach had become adherent to the abdominal wall, and that there was no general peritonitis. Upon laying open the stomach a most remarkable condition," says Dr Pitt, "presented

itself. The whole of the mucous membrane of the stomach, with the exception, of rather more than an inch to one and a half inches around the œsophagus near the cardiac end has been destroyed by malignant growth, and almost the whole of this, especially that involving the anterior wall, has sloughed away, leaving a ragged surface slightly depressed below the normal. In other parts the growth has sloughed, but the slough has not separated. There is a sharp line of demarcation at the pylorus beyond which the mischief does not extend. I do not remember to have seen such an extensive sloughing of a growth, and the extent of surface involved is unusual. The sloughing has laid bare the pancreas at one point, but there is no involvement of the pancreas by growth, though apparently there is some inflammatory infiltration." The rest of the pancreas was tough from venous engorgement. The spleen weighed five and a half ounces, and was tough and dry. The liver was small. The gall-bladder normal. There was extensive sloughing of the left lobe of the liver for a distance transversely of four and a half inches. The sloughing extended for a depth of two inches or less into the liver. Along the corresponding surface the wall of the stomach had sloughed away, and its place in closing in the stomach cavity was taken by the liver. There was a flat plaque of growth in the mucous coat of the stomach away from the sloughing area, and two or three small nodules in the left lobe of the liver. The glands and the supra-renal capsules were normal. The kidneys were pale, and weighed nine ounces, and under the microscope showed a few patches of small-celled infiltration. Histological examination of the growth shewed that it is a spheroidal-celled carcinoma. See *Insp.*, 1897, No. 481.

CASE 269. *Carcinoma of the lesser curvature of the stomach. Perforation. Suppurative peritonitis.*—George H., æt. 63, was admitted under Dr. Pitt on December 21st, 1896, and died on February 21st, 1897. The present illness began in March, 1896, with vomiting after food and pain in the epigastric region. He gradually got weaker and was admitted to the hospital. On admission there was a hard nodulated swelling in the epigastric region which was thought to be enlarged liver. The tumour moved with respiration, was pulsating and tender. The stomach resonance was normal. Carcinoma hepatis was diagnosed. From week to week the patient's condition varied. He was thought to be improving till January 22nd, when he became subject to hallucinations. These, however, disappeared and once more he seemed better. But on February 20th he grew weaker and ascites came on, not apparently attended with any pain in the abdomen. On the 21st he died early in the morning. At the autopsy the hair was grey and the body was emaciated. There were old adhesions at the back of both apices with patches of iron-grey induration due to healed phthisis. At the bases the lungs were somewhat airless and there was muco-pus in the smaller tubes. There were no secondary deposits in the thoracic glands. The diaphragm was adherent to the liver. The heart weighed nine ounces and was of a brownish colour. There was slight atheroma of the aorta. The stomach was adherent to the under surface of the liver by old and recent adhesions, and there was a considerable quantity of recent lymph upon it. It was found to be occupied by a saddle-shaped growth extending the whole distance along the lesser curvature and involving nearly the whole of the organ except the fundus.

The edges of the growth were raised and very prominent, soft and white on section. The part along the lesser curvature towards the pylorus was sloughy and in an exceedingly offensive putrid condition. There was a perforation of the anterior surface about an inch from the pylorus with a condition of general purulent peritonitis, the abdominal cavity containing one hundred and twenty-six ounces of turbid fluid. The intestines were normal except that they were matted together. There was recent lymph on the liver and a deposit of carcinoma between the adhesions between the liver and the diaphragm over the upper surface of the right lobe. There were, however, no secondary deposits in the liver itself. The pancreas was normal. The glands were free from secondary deposit. The spleen was small and fibrous with some blackening of its capsule. The gall-bladder contained three faceted gall-stones moulded to the cavity which was about as large as usual. The bladder itself was adherent to the anterior abdominal wall and to the duodenum. The kidneys were normal except that the surface was slightly granular and they were anæmic. See *Insp.*, 1897, No. 79.

CASE 270. *Carcinomatous ulcers of pylorus and lesser curvature of stomach. Secondary deposits in liver, pleura and glands.*—William T., æt. 45, was admitted for sickness and pain in the left side, under Dr. Pye-Smith on February 15th and died on February 22nd, 1897. At the end of last December the patient was suddenly seized with sickness and vomiting, since which time he has had vomiting nearly every day and has been unable to retain his food on his stomach. Latterly he has become much thinner. The patient attended the Out-Patient Department on February 7th and was treated. He was admitted on the 15th and was then found to be wasting, but clinical examination revealed nothing definite. The muscles of the abdomen were rigid. There was some tenderness on palpation of the epigastric region. February 18th, the patient is in much pain, troubled with hiccough and at intervals bringing up liquid vomit. February 20th, worse to-day. Great epigastric pain; vomits very frequently and the vomit is of a dark brown colour. It contains no hydrochloric acid but a quantity of lactic acid, together with blood and bile. Dr. Pye-Smith diagnosed hæmatemesis, gastric ulceration (probably carcinomatous), and ordered a blister to the epigastrium. On February 24th the patient appeared a little better. On the 27th he was very weak and much worse, lying in a drowsy condition, and on the evening of that day he died. At the autopsy the body was much emaciated and the lungs showed signs of healed phthisis. There were a few secondary deposits on the pleura appearing as white plates with puckering around. The largest deposit was in the left interlobar fissure where the deposit was slightly cupped. There were no deposits actually in the lung tissue. A black gland at the bifurcation of the trachea showed a quantity of white cancerous deposit. The heart weighed seven and a half ounces and the arteries were good. The stomach was considerably distended and contained about one and a half pints of dark brown grumous material. When opened it was found that at the middle of the lesser curvature there was a circular ulcer about one and a half inches in diameter the base of which was formed of white cancerous material. At this point the stomach was adherent to the pancreas. There was a second cancerous ulcer almost encircling the pylorus, about three quarters of an inch at its widest part. A white deposit of carcinoma was seen in the base of

the ulcer beneath the serous covering of the stomach. The pyloric ring did not appear to be stenosed, the finger passing through it as readily as usual. The liver weighed forty-seven ounces and was infiltrated with some nodules of growth, most numerous in the left lobe and many of them umbilicated. The mesenteric glands contained secondary deposits. The spleen weighed three ounces and was normal. The supra-renal capsules and kidneys were normal. *See Insp.*, 1897, No. 87.

CASE 271. *Carcinoma of the lesser curvature and cardiac end of the stomach. Secondary deposits in lymphatic glands invading pancreas and spleen. Ascites, anasarca.*—James C., æt. 49, was admitted under Dr. Hale-White, on March 29th, 1897, for vomiting after food, and swelling of the legs. He died on April 8th. The patient is a labourer, and has lived in India for twelve years. He has also been a heavy drinker, and has suffered from gonorrhœa and syphilis. In July, 1896, he was in St. Saviour's Infirmary seven weeks suffering from dyspepsia and vomiting after food. For the last five years he has suffered from chronic bronchitis. A fortnight ago his feet began to swell, and a few days later his thighs and abdomen. On admission he was pale and wasted, with considerable œdema of the lower extremities. There was also ascites. The liver and spleen could not be felt. The chest was emphysematous, dull at the bases, and there were a few scattered râles to be heard. He was put on to *mistura copaiabæ resinæ* till the ascites disappeared. He seemed for a time to get better, then relapsed again, his prominent symptoms being shivering fits and diarrhœa, with some rise of temperature. The diagnosis made in the Ward was cirrhosis of the liver. At the autopsy the body was emaciated, and there was a considerable degree of anasarca. The brain was normal. At both apices there were a few scattered nodules indicative of healed phthisis. There were no secondary deposits in the thorax. The heart weighed nine ounces, and the aorta was somewhat atheromatous. The veins at the lower end of the œsophagus were large and distended, just as they often are in cirrhosis of the liver. The stomach on being laid open was found to contain a growth of considerable size, large and fungating. The growth itself was a saddle-shaped mass occupying the lesser curvature, and the cardiac third of the organ, the pommel of the saddle being towards the cardia, and at this part the growth almost encircled the organ. In the glands on the lesser curvature were numerous secondary deposits causing the lesser omentum to be thickened and stiffened. The intestines were normal. The abdomen contained one hundred and two ounces of ascitic fluid having a turbid, dirty yellow colour. The liver weighed forty-seven ounces, and was normal, being quite free from cirrhosis. The pancreas was normal, except that at the tail of it there was a deposit of carcinoma, probably extending from a neighbouring gland. The lymphatic glands were normal, except those about the pancreas. The spleen weighed four ounces, and there was a mass of growth extending into it along the hilum. The supra-renal capsules and kidneys were normal. *See Insp.*, 1897, No. 134.

CASE 272. *Carcinoma of pyloric end of stomach. Secondary deposits in liver and lymphatic glands. Exploratory laparotomy.*—Annie H., æt. 56, was admitted under Mr. Lane on May 3rd, 1897, for continuous pain in the

abdomen and sickness, and died on May 6th. The patient had good health till eight weeks ago, when she suffered from continuous pain over the region of the gall-bladder. She had sickness and constipation. The sickness ceased one week before admission. On admission her temperature was normal and she was suffering from frequent pain in the epigastrium. At 4 p.m. Mr. Lane made an exploratory laparotomy and discovered a growth in the stomach with secondary deposits. Nothing further could be done. On May 4th the patient seemed better but twenty-four hours after the operation her breathing became difficult and she died at 5 a.m. on the 6th. At the autopsy the body seemed fairly well nourished and the laparotomy wound was in apparently a healthy condition. The pleuræ showed some old adhesions and the lungs were in an emphysematous condition with some patches of broncho-pneumonia. The heart and aorta were both healthy. The stomach was of normal size and capacity but at the pylorus there was an encircling mass of growth five and a half inches in circumference, hard and nodular. It showed considerable ulceration of its internal surface and extended about two and a half inches from the pylorus into the stomach. The pylorus admitted the index finger without difficulty and was not adherent to adjacent organs. The duodenum and jejunum were congested. On the duodenal side of the pyloric orifice was a small amount of ulceration, but the growth seemed strictly limited by the pylorus. The liver weighed fifty ounces and was healthy in appearance except for two small secondary deposits. A number of glands in the mesentery around the duodenum were affected with growth. The spleen weighed four ounces and was healthy. The supra-renal capsules were free from secondary deposits and the kidneys were healthy except that the capsules were slightly thickened and unduly adherent. See *Insp.*, 1897, No. 176.

CASE 273. *Carcinomatous stenosis of the pylorus. Gastro-duodenostomy. General suppurative peritonitis. Secondary deposits in lymphatic glands. Abscesses in the lungs.*—Richard T., æt. 51, was admitted on June 23rd, 1897, under Mr. Dunn for vomiting, and died on July 15th. Four months ago the patient began to suffer with pain across the abdomen after every meal, and a sensation of nausea. He was treated for dyspepsia. He has lost a good deal of weight. Inspection of the abdomen revealed some bulging on the left side and the outline of the stomach was partially visible. A rounded tumour was felt to the right of and above the umbilicus two inches in diameter. On July 6th gastro-duodenostomy was performed. On July 15th the patient died with signs of peritonitis. At the autopsy the body was much wasted and the median incision in the abdomen made at the operation was healed. Both lungs were emphysematous and shewed numerous patches of breaking-down broncho-pneumonic consolidation. The heart weighed twelve ounces and there was a little serous fluid in the pericardial sac. The abdomen was distended. On opening the peritoneal cavity there was general suppurative peritonitis, the peritoneum being dull and lustreless and covered with flakes of yellowish lymph. There was a good deal of foul-smelling purulent fluid in the posterior part of the abdominal cavity. The cause of the peritonitis was found to be a breaking-down of the stomach and duodenal tissues around the Murphy's button which had been used. As a result of this breaking-down the stomach contents in particular had escaped into the peritoneal cavity. There was a large, hard, carcinomatous growth, involving the pyloric

end of the stomach, sharply limited by the pyloric ring on one side and extending along the lesser and greater curvature to the left and invading the wall of the stomach for about three inches. There was a tight pyloric stricture. The orifice was about the size of a No. 12 catheter. The operation wound was in the anterior surface of the stomach about in the centre. There was very little ulceration of the growth. There was a polypoid-like mass of growth projecting into the lumen of the organ from the posterior wall near the lesser curvature, and about two inches from the pyloric orifice. There was a tongue of growth entirely surrounding the hepatic artery posteriorly, and this was adherent to the portal vein. A pylorotomy would therefore have included a ligature of the hepatic artery and very likely a wound in the portal vein. The large and small intestines were normal except for the peritonitis. The liver weighed fifty-two ounces and contained no secondary deposits. The lymphatic glands in the neighbourhood of the primary growth were infiltrated with deposit. The spleen weighed four ounces and was normal. The supra-renal capsules and kidneys were normal. The growth was a cylindrical carcinoma. The cells were large and contained large nuclei. They were mostly spheroidal in shape. *See Insp.*, 1897, No. 268.

CASE 274. *Carcinoma of the cardiac end of the stomach extending into the œsophagus*.—Frank F., æt. 45, was admitted for dyspepsia and abdominal pain, under Dr. Goodhart, on August 5th, 1897, and died on October 3rd. Seven months ago he suffered from abdominal pain and dyspepsia; also from vomiting. No hæmatemesis. Four months ago he passed a lot of matter in his motions. On July 3rd, 1897, he came in, under Dr. Goodhart, with epigastric pain. He was discharged on the 15th, and was re-admitted on August 5th. On admission he was suffering from abdominal pain, anæmia and weakness. No abdominal tumour felt. The second sound at apex reduplicated; pulmonary systolic bruit. August 24th, diarrhœa. August 30th, vomiting. September 21st, troubled with diarrhœa. October 3rd, died. At the autopsy, the body was extremely pale and much wasted. The lungs were a little œdematous. The pericardium was also œdematous. The heart weighed nine and a half ounces, and both ventricles were a little dilated. There was a large, fungating mass of growth involving the cardiac end of the stomach. It had undoubtedly started from the cardiac end immediately below the diaphragm. In shape it was like a mushroom. The shape was due to the limitation of the growth by the diaphragm. All round the cardiac orifice and below it, a large fungating, ulcerated growth projected into the lumen of the organ, the growth having extended a slight distance up the œsophagus. The growth was rather soft and friable, and appeared to be vascular. There was a small Meckel's diverticulum, but otherwise the intestine was normal. The liver weighed fifty-eight ounces, and was free from secondary deposits. The gall-bladder, pancreas, mesenteric glands normal. The spleen weighed five ounces, and was normal. Supra-renal capsules normal, and the kidneys which weighed nine ounces were pale. Histologically, the growth was a columnar-celled carcinoma. *See Insp.*, 1897, No. 389.

CASE 275. *Carcinoma of the pyloric end of the stomach*.—Thomas H., æt. 46, was admitted under Dr. Pye-Smith on October 4th, 1897, with a mass in

the abdomen in the region of the pylorus. He died on November 9th. The mass appeared to be about the size of a Tangerine orange. The patient was much emaciated and had been vomiting constantly. The stomach was found to be enormously dilated. The stomach was washed out every day for some time. At first the patient was relieved, but later he appeared almost moribund. Washing was omitted, when he again picked up for a time. An operation was discussed, but it was thought that the growth was too far advanced. Ultimately he became very emaciated. The stomach only was examined. It was found to be very much dilated, measuring about seven by nine inches. About half an inch from the pylorus was a hard, carcinomatous growth about the size of a Tangerine orange. The pylorus was not invaded. See *Insp.*, 1897, No. 431.

CASE 276. *Carcinomatous infiltration of the stomach. Secondary deposits in liver, lymphatic glands and spleen. Ascites.*—Elijah R., æt. 62, was admitted for pain and swelling in the abdomen, under Dr. Washbourn on October 19th, 1897, and died on November 17th. The patient has been subject to recurring attacks of ague, usually twice in the year, ever since he was stationed many years ago in Malta. Three months before he came into the hospital he was attended by a doctor for pain in the chest and cough. A fortnight before admission he noticed a swelling in his abdomen just below the margin of the ribs on the left side. This gradually reached the middle line. He has been losing flesh since last Christmas. On admission he was emaciated, troubled with constipation and had a pain in the epigastrium, worse after food and at night-time. An irregular, hard, nodular mass is felt below the left costal margin, which can be traced nearly as far as the middle line. It is painful to the touch. The liver extends almost to the umbilicus, and has an irregular edge in which two small nodules can be detected. During the time the patient was in the hospital the swelling on the left side gradually disappeared, whilst the nodules in the liver became more palpable. For the last few days of his life he vomited persistently, and died on the morning of the 17th. He had a double inguinal hernia which gave him no trouble. At the autopsy the hair was grey and the body emaciated. There were old adhesions at the right apex with healed phthisis, and collapse of the right lower lobe. There was in that lobe a small secondary deposit and also a deposit on the diaphragmatic surface of the left lung. There were no deposits in the mediastinal glands. The heart weighed nine and a half ounces, and the aorta was atheromatous. The stomach was of normal size, and its mucous membrane was free from ulceration. Its walls were thickened by a cancerous deposit invading the whole of the organ with the exception of the cardiac extremity and an area on the anterior wall, just below the œsophageal orifice, measuring about two inches in length and an inch transversely. At the fundus and on the anterior surface the growth was not of the infiltrating variety but appeared as separate flat nodules beneath the mucous membrane, varying in diameter from an eighth to half an inch. The growth was strictly limited by the pylorus. The intestines were normal. The liver weighed ninety-eight ounces, and was greatly infiltrated with growth. On section some of the growths shewed hæmorrhage into them. The peritoneal cavity contained sixty ounces of serous fluid. Many of the glands in the

portal fissure had deposits of growth in them. The spleen weighed five ounces, and shewed growth at the hilum. The supra-renal capsules were normal. The kidneys were somewhat hard from congestion. *See Insp.*, 1897, No. 436.

CASE 277. *Carcinomatous stenosis of the pylorus. Gastro-jejunostomy. Peritonitis, pleurisy. Secondary deposits in the lymphatic glands.*—Samuel P., æt. 42, was admitted to Job ward under Mr. Lucas, on January 2nd, 1898, and died on February 4th. He came in for vomiting, constipation, and abdominal pain. For the last six months he has had pain in the left hypochondrium, worse after food. He was treated at Out-patients for about five months with bismuth. Recently has had attacks of vomiting two or three times a week, and has become weaker, and lost weight. On December 4th, 1897, was admitted into Philip ward, where the stomach was washed out daily. On admission into Job ward, the pain was marked, and there was frequent vomiting. Indistinct tumour in the epigastrium. Liver normal. On January 31st, gastro-jejunostomy was performed, Murphy's button being used. The temperature gradually rose. No vomiting. Died suddenly. At the autopsy the body was much wasted, and there was recent lymph over the right pleura. There were old fibrous adhesions over the left lower lobe. The lungs were cedematous, and showed some hypostatic pneumonia. There was recent lymph on both sides of the diaphragm. The heart weighed seven and a half ounces, and the pericardium contained an ounce of serous fluid. The stomach was not obviously dilated. About two-thirds along the greater curvature from the cardia, on the anterior surface near the lower border, was the wound of the gastro-jejunostomy operation. The peritoneum was congested in patches. No plastic union had taken place. On the right side of the wound was an ulcerated opening in the gastric segment, through which the button could be seen, and from which gastric contents were exuding into the peritoneum. The junction in the jejunum was about six inches from the end of the duodenum. The pylorus externally was scarcely enlarged, but hard and thickened. It admitted the index finger. An incision showed an ulcer the size of a half-crown, with raised, hard edges, involving and extending into the pyloric ring, situated on the lesser curvature, and encroaching on the anterior and posterior surface, yet not affecting the lower border. The glands around the head of the pancreas in the gastro-hepatic omentum, as high as the cardia, and in the portal fissure, were all affected with secondary deposit, and matted in places. The spleen, pancreas, and supra-renals were all normal. The liver weighed fifty ounces, and showed early fatty change. There was excess of serous fluid in the peritoneum with general sticky peritonitis. The cultivation from the peritoneal effusion showed a pure culture of the bacillus coli communis. The kidneys were healthy. *See Insp.*, 1898, No. 56.

CASE 278. *Carcinoma of the cardiac end of the stomach and lower end of œsophagus. Gangrene of lung.*—Richard W., æt. 56, was admitted under Dr. Taylor for pyrexia, pain in the chest, and dysphagia on July 5th, 1898, and died on July 22nd. He was taken into the hospital on July 1st, under Mr. Symonds for œsophageal growth, but a bougie was found to pass without difficulty. On admission he was pigeon-breasted; the thoracic movements

were shallow. There was impaired resonance on the right side below the angle of the scapula, with deficient vesicular murmur. Crepitating râles and a pleuritic rub were also heard. Rigidity and tenderness of the epigastrium, and over the left kidney. He was unable to take solid food. July 12th: Sputum very foul. July 21st: Weaker and does not take food very well. More dulness and deficient entry of air on the right side. The chest was explored with a needle and no fluid was found. At the autopsy the body was much wasted and the right pleural cavity contained about two pints of purulent fluid, the whole of the right lung being covered with recent lymph. At the right base on the inner side of the right lower lobe was a large gangrenous cavity, containing a large ragged-looking slough of gangrenous lung tissue, very foul smelling. The cavity was surrounded by pneumonic lung, in fact the remainder of the lower lobe was pneumonic. The pericardium over the right ventricle was oedematous. The heart weighed ten and a half ounces, and the muscle was pale. The first part of the aorta was considerably dilated. A carcinomatous growth was found involving the last inch of the œsophagus and the cardiac end of the stomach, spreading along and involving for about two inches the lesser curvature of the stomach. The growth in the stomach was much thicker and more extensive than that in the œsophagus. There was considerable narrowing of the cardiac orifice. The mucous surface was very ragged-looking and ulcerated. The stomach was small. The gangrenous cavity of the lung was adjacent to the growth and the lung was adherent to the growth. "I could not find any perforation," says Dr. Bryant, "of the growth." The intestines were normal. The liver weighed fifty-eight ounces, and was normal except for a little local capsulitis. The spleen weighed six ounces, and the spleen, kidneys, glands and supra-renals were all healthy. Microscopical examination of the growth showed that it was a spheroidal carcinoma with abundant stroma. See *Insp.*, 1898, No. 282.

CASE 279. *Carcinomatous ulcer of the cardiac end of the stomach. Secondary deposits in liver and lymphatic glands. Ascites.*—James W., æt. 48, was admitted under Dr. Pye-Smith, with pain in the epigastric and right hypochondriac regions, on August 5th, 1898, and died on October 3rd. The patient began to suffer pain on the right side, behind the left shoulder-blade, ten weeks ago. At that time he vomited very frequently, the vomit being of a greenish colour. Soon afterwards he noticed that his abdomen was becoming swollen. During the eight weeks preceding admission he lost one and a-half stone in weight. On admission, the liver was considerably enlarged, reaching to the level of the umbilicus, and there was ascites. The urine contained neither sugar nor albumen. On August 6th, it was thought that the patient was probably suffering either from cirrhosis or from cancer of the liver. August 19th, œdema of legs. 22nd, no jaundice. 24th, conjunctivæ tinged with yellow. 28th, ascites increased. Abdomen tapped, and five and a-half pints of greenish-yellow albuminous fluid were withdrawn. August 30th, the case was diagnosed as cancer of the liver, a secondary nodule being felt in the right iliac region. September 3rd, patient again tapped. September 5th, peritoneal rub over the liver, and a hard nodule felt in the right lobe of that organ. 7th, delirious at night. 12th, considerable jaundice. 15th, jaundice more marked. 24th, great emaciation. 26th, semi-comatose. 29th, complained of great abdominal pain, gradually sinking, and dying on October 3rd.

At the autopsy, the body was deeply jaundiced and wasted. The stomach showed a carcinomatous ulcer, having a saddle shape, with raised, white edges, situated close to the œsophageal orifice, and extending on to the anterior and posterior surfaces of the stomach about three or four inches. There were large secondary deposits in the glands in the lesser omentum. The character of the edges of the ulcer left no doubt as to its malignant nature. There were considerable secondary deposits in the glands, along the lesser curvature of the stomach. There was a considerable amount of fluid in the peritoneal cavity, and some recent lymph over the surface of the liver. The liver was greatly enlarged, weighing no less than one hundred and thirty ounces. The right lobe was almost entirely infiltrated by carcinomatous deposit, and on its surface were numerous umbilicated nodules. There was no enlargement of the glands at the end of the œsophagus. Many lymphatic glands of the abdomen contained secondary deposits, and the spleen shewed recent infarcts. The supra-renal capsules were normal. There was fluid on both sides of the chest, thirty-six ounces on the right, and thirty-five ounces on the left. The lungs were normal, except for some compression. The heart and kidneys normal. Histologically, the growth was a spheroidal-celled carcinoma, with not much stroma. The muscle was infiltrated and partly destroyed by the growth, the cells of which were in parts deformed by pressure. In the liver, the secondary deposits had exactly the same kind of structure, a spheroidal carcinoma, with small alveoli and abundant stroma. *See Insp.*, 1898, No. 370.

CASE 280. *Carcinoma of cardiac end of stomach and of œsophagus. Perforative peritonitis. Gastrostomy. Empyema.*—William B., æt. 47, was admitted under Mr. Symonds for difficulty in swallowing, on September 23rd, 1898, and died on October 30th. The patient is said to have been unable to take solid food for a long time. On passing a bougie an obstruction was felt in the region of the cardiac orifice. On October 3rd gastrostomy was performed and the patient went on well until the 23rd, when the temperature rose to 103.2°. On the next day it was rather lower, but on the 30th it again rose to the same point and he died in the afternoon. The hair was slightly grey and the body was thin. Lymph on both pleuræ and each pleural cavity contained two or three ounces of pus. The lungs were large and emphysematous, their posterior parts being somewhat deficient in air. In the right lung at the upper part of the back of the lower lobe was a patch of grey hepatization measuring an inch in diameter. "The lymph was so abundant in the chest, that," says Dr. Perry, "I am inclined to believe that the suppurative peritonitis started from the softening of the growth immediately beneath the diaphragm." The bronchial glands were large and red and there was much lymph on either side of the diaphragm. The heart weighed twelve ounces. When the œsophagus was opened it was found that the lower half of it was somewhat dilated, and just above the cardiac orifice it measured two and a half inches. The œsophagus was removed with the rest of the viscera, but no part of the growth was removed with it. The opening in the stomach was found midway between the cardiac and pyloric orifices on the anterior surface just above the attachment of the greater omentum. It appeared that the abdominal wall was firmly adherent to the stomach, and as far as I could judge no leak had taken place in this part. Nevertheless, there was general

purulent peritonitis, the coils of intestines being covered by thick deposits of lymph, and in the pelvis was some pus. I think that this peritonitis arose from the ulceration of the growth and not from any defect of the operation. When the stomach was opened it was found to be of fair size, containing about half a pint of material. At the cardiac orifice there was a prominent bossy growth surrounding the orifice and involving the lesser curvature for about a third of its length. The growth was deeply ulcerated on the lesser curvature and it invaded the last inch of the œsophagus, causing obstruction. The growth was clearly a gastric growth and not an œsophageal growth. The liver weighed fifty-four ounces and was normal. The glands were normal. The spleen weighed four ounces and was normal. The supra-renal capsules and kidneys were normal. Histologically the growth was a spheroidal-celled carcinoma with very scanty stroma. See *Insp.*, 1898, No. 395.

CASE 281. *Carcinoma of the cardiac end of the stomach. Epitheliomatous stricture of œsophagus. Gastrostomy.*—George S., æt. 59, was admitted under Dr. Taylor, with difficulty in swallowing, on January 2nd, 1899, and died on February 11th. Eight weeks before admission the patient found he could not swallow solids. Since then he has been gradually getting worse. On admission he was put upon milk. The œsophagus was examined and a stricture was found situated twelve and a half inches from the teeth. An enlarged gland was found under the right sterno-mastoid. On the 11th, the patient weighed seven stone three and a half pounds. On the 23rd, seven stone nine pounds. On February 6th, seven stone one pound. Mr. Symonds operated, performing gastrostomy. After the operation the patient remained very weak and on February 8th the temperature rose to 100°. On the 11th he complained very much of pain in the chest and in the evening he died. At the autopsy the body was wasted. There was an opening at the upper border of the rectus and through the opening some of the mucous membrane of the stomach had prolapsed. The stomach itself had been made fast to this opening. The subperitoneal tissue was in a sloughy condition, containing foul pus and a similar condition prevailed beneath the skin. The stitches were very loose indeed and free leakage must have occurred. There was a condition of general peritonitis with about a pint of turbid fluid in the pelvis. The right lung showed healed phthisis of the right apex. There was œdema of the left lower lobe. There were no secondary deposits in the mediastinal or bronchial glands. The trachea was not opened by the growth. The bronchial glands were black and not apparently containing secondary deposits. The pericardium was normal. The aorta atheromatous. The heart weighed eight ounces and was normal. In the œsophagus, situated six inches from the opening of the larynx, was an encircling growth three inches in length. The growth was unusual, since it was nodulated and consisted of broad and rather prominent masses. There was very little ulceration. A probe could be passed through the stricture but it would not admit the little finger. Going still further down the œsophagus, at the cardiac orifice was a large masses of softening, foul-smelling growth. A similar mass of growth was in the gastro-hepatic omentum. "It appeared to me," says Dr. Perry, "that the second growth was primary in the stomach and of a different character to that in the œsophagus, for the following reason:—The growth was exceedingly soft and diffuent and had ulcerated extensively, and there were secondary deposits in

the glands, whereas I could find no glands with secondary deposits close to the œsophageal growth." The liver weighed fifty-six ounces and was free from secondary deposit. The intestine was normal. The lymphatic glands in the gastro-hepatic omentum had secondary deposits. The spleen weighed four ounces and was normal. The kidneys weighed eleven ounces and showed a large number of small cysts. Histologically the œsophagus presented the appearance of the usual squamous epithelioma with many cell-nests. The growth in the stomach was of quite a different type. It was a spheroidal carcinoma with very scanty stroma. The cells were much smaller than those in the gullet growth. *See Insp.*, 1899, No. 42.

CASE 282. *Colloid carcinoma of the pyloric end of stomach. Malignant peritonitis. Secondary deposits in liver and lymphatic glands. Phthisis.*—Mary P., æt. 42, was admitted under Dr. Hale-White, on December 5th, 1898, with abdominal pain, vomiting, and constipation. She died on April 14th 1899. First noticed pain on the left side of the abdomen two years ago. Since that time she has begun to get weaker and thinner. Five weeks before admission the patient got worse, vomiting began, and the bowels became constipated. On admission, a hard painful swelling was to be felt in the abdomen continuous with the edge of the liver, the edge being situated one and a half inches above the umbilicus. The swelling is most distinct in the left epigastric angle, and is resonant all over. The case was diagnosed as carcinoma of the liver, probably secondary to growth in the stomach. The patient continued to vomit, and constipation was troublesome. The abdomen was very tender, and the stomach frequently distended, so that its outline could readily be perceived. On January 8th the patient was seized with intense pain in the right leg, which began to swell. On March 1st the abdominal tumour seemed to be increasing in size. A few days later the temperature rose to 100·8°, and a small patch of dullness developed in the right axilla. Towards the end of the case the abdominal distension increased, and many lumps were felt in the abdomen, especially on the right side below the costal margin. The temperature rose from normal to 100·2°, but during the last twenty days it became subnormal. The patient gradually sank and died, and at the autopsy, when the abdomen was opened, it was seen that there were numerous small, button-like masses of gelatinous material in the peritoneum, and the cavity itself contained eighty-four ounces of serous fluid. On the stomach and elsewhere, particularly on the colon, were similar small lumps, and the omentum was pulled up, and considerably thickened. The stomach was larger than normal, and there was some hypertrophy of its coats where not affected with growth. The growth itself was of a funnel-shape, sharply defined by the pylorus, and measuring three inches in length. It was an encircling growth, and the index finger passed through it without much difficulty. On opening it up, it was seen to consist of a thick layer of colloid material in the submucosa, in parts replacing the muscular tissue. The surface of the growth was denuded of mucous membrane, and in one place there was a depressed area forming a considerable hollow just in front of the pylorus. On the serous surface of the stomach were numerous colloid bosses of small size, but thickly set. There were adhesions to the gall-bladder and the under surface of the liver, and on the gall-bladder itself were some masses of growth into which

hæmorrhage had taken place. The small intestines were normal. The large intestines were also normal, except that they showed small deposits of growth. The liver weighed forty-six ounces, was pale, and there were a few small white nodules of growth just beneath the capsule. There were no other secondary deposits, and the tumour felt in the abdomen was clearly the stomach, and not the enlarged liver. The right pleura was adherent to the apex, and on its surface were a few miliary tubercles. The middle part of the lung was free from deposit, but at the base of it there were small white nodules which seemed to have been secondary deposits, similar nodules having been found on the upper surface of the diaphragm. Both lungs were in a similar condition, pale and œdematous as to their lower parts, and the upper lobes solid. On cutting into them, it was seen that there was old phthisis at the apex, with recent tuberculous, broncho-pneumonic consolidation around. There were no secondary deposits in the lungs or in the thoracic glands. The heart weighed six and a half ounces, and was normal. The pericardium normal. The pancreas, lymphatic glands, supra-renal capsules normal. The spleen weighed four and a half ounces, and was adherent to the diaphragm. The kidneys were healthy. There was old pelvic peritonitis, and much congestion of the last four inches of the rectum. Histologically, the growth was a cylindrical carcinoma, the alveoli being large, lined with cubical epithelium, and filled with spheroidal cells. There was much colloid change. See *Insp.*, 1899, No. 109.

CASE 283. *Carcinoma of pylorus. Secondary deposits in lymphatic glands. Exploratory laparotomy.*—Thomas C., æt. 39, was admitted for abdominal tumour under Dr. Hale White on April 1st, 1899, and died on April 16th. In October, 1898, the patient was suddenly seized with pain in the left side of the abdomen and went to a doctor by whom he was told he was suffering from colic. The pain continued and the patient had to leave off work at Christmas. Vomiting then commenced, lasting two weeks and then stopped. At that time the doctor noticed a tumour. On admission a hard, rounded mass was felt in the left hypochondriac and epigastric region, which moved downward half an inch on inspiration. There was impaired resonance immediately over the tumour but when the stomach was inflated with carbon dioxide the dulness diminished. The tumour was thought, therefore, to be behind the stomach. On April 12th laparotomy was performed by Mr. Lane. An incision was made to the left of the middle line and another horizontally outwards from it below the left costal margin. The tumour proved to be a large carcinoma involving the stomach and the transverse colon. The patient vomited a good deal after the operation. The temperature rose to 102° and the patient died on the 16th. The skin incision looked perfectly healthy, but on opening it up there was found some diffuse suppuration in the abdominal wall, and a localised suppurative peritonitis immediately beneath. On separating the recent adhesions a quantity of foul pus escaped. A mass of growth as large as a cricket-ball occupied the pyloric ring of the stomach. It protruded mostly posteriorly. To its lower edge the transverse colon was firmly adherent, and to the right the second part of the duodenum. Posteriorly the pancreas was adherent, and the neighbouring tissues were matted together. On cutting through this several glands were found containing secondary deposits. Some of the glands in the portal fissure were also

invaded by growth. The mass itself extended three and a half inches from the pyloric orifice towards the cardia and involved both walls of the stomach. It was strictly defined towards its distal margin but the cardiac edge was exceedingly irregular. The mass projected into the interior of the stomach, and was very irregularly ulcerated on its inner surface. All the coats of the stomach were involved, and the growth measured one and a quarter inches in thickness at its broadest part. The liver weighed fifty-nine ounces, and was normal. The spleen showed some recent capsulitis. The gall-bladder, glands, supra-renal capsules and kidneys were healthy. Histologically the growth in the stomach was a cylindrical carcinoma with well-marked fibrous stroma. In some parts the growth extended from the submucosa into the muscular coat. *See Insp.*, 1899, No. 113.

CASE 284. *Diffuse sarcoma of the stomach. Many secondary deposits in glands. Exploratory laparotomy.*—William B., æt. 22, a farm labourer, was admitted on April 23rd, 1899, under Dr. Shaw, for wasting and pain of three months' duration and swelling of the abdomen of two months' duration, and died on May 21st. As a boy had ague, but no recurrence for many years. History otherwise healthy up to new year; since then occasional sickness after food. Pain colicky in character and relieved by pressure. On admission a tumour occupied the left side of the abdomen, running parallel to the left costal margin, the edge being several inches below that, and then in a circular direction extending to within about two inches of the iliac crest, occupying somewhat the position, as to part of it, that an enlarged spleen occupies. It was freely movable on respiration, hard, had a definite edge, and presented two movable nodules on the surface. Resonance variable, mostly good. Left lung dull at base. On May 12th Mr. Jacobson performed an exploratory laparotomy and found a growth involving the stomach. The patient gradually sank without abdominal tenderness. At the autopsy the wound had healed perfectly except for an inch at the lower part. The body was much wasted. The lungs were emphysematous and the left chest contained a pint of fluid somewhat compressing the lung. The heart weighed nine ounces. The stomach was adherent to the left lobe of the liver, the spleen, the diaphragm, the splenic flexure of the colon and the pancreas. It measured thirteen inches in its longest straight line. It was infiltrated with a malignant growth, moderately soft and white, throughout its whole extent except one square inch near the pylorus. The wall for the most part was half an inch thick over the anterior surface and thicker behind and at the fundus. There was a ragged, ulcerated surface all over the posterior wall, eight inches in diameter each way. The ulceration did not extend deeply into the growth at any part. The duodenum was invaded one inch below the pylorus (which was healthy) by growth from without, communicating by an aperture, the size of the little finger, with an abscess cavity containing greenish pus, extending behind the pyloric end of the stomach for four inches. This apparently a direct invasion from the stomach. The large intestine was healthy. The splenic flexure was adherent to the growth but not invaded. The rectum contained masses of scybala. There was localised lymph in the neighbourhood of the pylorus and of the wound. Masses of growth varying in size from one to two inches in diameter along the greater curvature, with smaller masses of growth, button-shaped or globular, scattered in the omentum.

The liver weighed seventy-two ounces and the left lobe was firmly adherent to the growth. The capsule was thick. There were no secondary deposits in the liver. In the transverse fissure were two large, hard glands; and a huge mass of infiltrated glands, some large, soft, and blood-stained, some white and not broken down, one orange-coloured, in the lesser curvature above the stomach. The glands were infiltrated throughout the mesentery and one mass had broken down into an abscess at the root of the mesentery. There was a growth two inches in diameter at the head of the pancreas, breaking down in the centre into soft, pultaceous, blood-stained material. The spleen was large and distended by a spherical mass of growth two and a half inches in diameter. The suprarenal capsules were healthy. The kidneys weighed ten and a half ounces and were healthy. Histologically the growth was a small, round-celled sarcoma. *See Insp.*, 1899, No. 158.

CASE 285. *Carcinoma of the pyloric third of the stomach. Healed phthisis. Tuberculous ulceration of bowel with caseous mesenteric glands.*—Florence B., æt. 44, was admitted with abdominal pain on February 28th, 1899, and died on June 23rd, under Dr. Shaw. Six weeks before admission the patient began to suffer with pain in the stomach after eating, and later from vomiting. The pain was about half an hour after meals, and about two hours after she would vomit and obtain relief. She has lately lost flesh, and having at first suffered from constipation, now suffers from diarrhœa. Vomiting lately has also been very free. On admission, she was pale and anæmic, and weighed five stone nine pounds. On abdominal examination a tumour was felt reaching down to the umbilicus on the right side of the abdomen, with a well-defined lower margin, and continuous above with the liver. The tumour was smooth and hard; but there was a small, round nodule just above the umbilicus, thought to be an enlarged gland. There was a short, systolic murmur. The urine had a low specific gravity, and contained a trace of albumen. March 3rd, vomiting continues. She remains in much the same state, sometimes vomiting frequently, sometimes free from sickness for several days. She would lose several pounds, and then gain them again. Early in June, the legs became cedematous, and the patient complained of a lump in her throat, which rose as she swallowed. Towards the end of the disease, the cedema increased, and there was dyspnœa on exertion of any kind. There was frequent vomiting, with great pain in the abdomen, for which morphia had to be employed. The tumour increased somewhat in size, reaching at last to below the umbilicus. There was some pyrexia throughout her illness, the temperature varying between subnormal and 101·4°. At the autopsy, the hair was turning grey, and the body was wasted. There was some cedema of the lower extremities. There was thickening of the pleura, with healed phthisis, at each apex. The lungs were small, and pitted readily upon pressure. No broncho-pneumonia, but in the right lung two infarcts of small size, one in the damson cheese stage, and the other browner. No secondary deposits in the thorax. The heart weighed five ounces, was small, brown and atrophied. All the organs were small. The aorta was very extensively atheromatous. The stomach shewed a growth occupying the pyloric third of the organ, and measuring about four inches transversely. It was an encircling growth, very vascular, and freely growing. The margins were much raised and overhanging, and towards the pylorus they projected, so that the first

part of the duodenum was dilated with a smooth mucous membrane, somewhat resembling the mucous membrane of the stomach. The pyloric orifice admitted without much difficulty two fingers, and there was, therefore, no stenosis. The central parts of the growth were slightly ulcerated, and on pressure an abundant milky juice exuded. The glands in the great omentum were large, many of them being as big as cherries. On section, they were not found, as expected, full of secondary deposit, but appeared to be ordinary caseous glands, some of which were softening. There were also softening glands in the portal fissure, and caseous glands in the right iliac fossa. Peritoneum normal. Ascites, none. Liver, fifty-four ounces, pale, soft and probably fatty. There were no secondary deposits. There was congestion at the lower end of the colon, and a small ulcer in the ileo-cæcal valve, probably tuberculous in character, as there was a caseous gland in the neighbourhood. The gall-bladder and pancreas were normal. The spleen weighed two and a-half ounces, and was pigmented, the cause of the pigmentation not being apparent. The right kidney was small and wasted, and weighed one ounce. The left kidney weighed rather more than four ounces, and was hard and pale. It appeared to be normal. Histologically, the growth was a columnar, epithelial carcinoma, some of the alveoli shewing a cubical lining of cells, whilst others were filled simply with spheroidal cells, the cubical arrangement at the margin having been lost. *See Insp.*, 1899, No. 203.

CASE 286. *Carcinoma of pylorus. Secondary deposit in liver.*—John, W. æt. 42, was admitted for pain and tumour in the abdomen on July 13th, 1899, and died on August 4th, under Dr. Hale-White. Malignant disease of the pyloric end of the stomach was diagnosed but the disease was too far advanced for operation. At the autopsy the stomach shewed several large, hard, masses of growth, glistening on section, at its pyloric end, the growth reaching from the orifice about four inches towards the cardia. The masses of growth were heaped one upon another and occupied both the anterior and the posterior surfaces of the stomach but not apparently completely encircling the pylorus as it is stated that there was no obstruction, but that the finger would readily pass through the ring. The intestines were normal. The liver weighed fifty-four ounces, and contained one small secondary deposit. There was a gall-stone the size of a small marble, and a mass of hard growth about the size of a hen's egg situated at the head of the pancreas, the rest of the organ being healthy. The spleen weighed seven ounces, and was normal. There were no secondary deposits in the lymphatic glands either in the thorax or abdomen. The mitral valve showed some old endocarditis. The suprarenal capsules and kidneys were healthy. *See Insp.*, 1899, No. 267.

CASE 287. *Carcinoma of the pylorus. Carcinomatous peritonitis. Caseous mesenteric glands.*—Catherine R., æt. 30, was admitted under Dr. Hale White on August 10th, 1899, for pain and swelling in the abdomen, and vomiting. She died on August 23rd. Family history unimportant. Previous history, scarlet fever, attacks of bronchitis, and sore throat. Attacks of peritonitis. Three years ago amenorrhœa for eleven months. Has been told that she has a retroverted, gravid uterus. Present illness, last March, vomiting after food. and abdominal pains. Gastric ulcer diagnosed. In June went forty hours

without passing urine. Has vomited blood. Fed per rectum for the last seven weeks. On admission temperature 96, pulse 98, respiration 28. Abdomen distended, typical signs of ascites. August 7th, tuberculous peritonitis diagnosed. August 17th, Mr. Fripp performed laparotomy, and seven pints of serous fluid were withdrawn. Adhesions were found, the vermiform appendix being bound down. Abdominal pain and vomiting continued until death. At the autopsy the body was wasted. The stomach was not dilated. The pyloric end was much thickened, especially near to the pyloric ring, where the wall was nearly half an inch thick. The thickening was sharply limited by the pyloric ring, and there was considerable pyloric obstruction. There was no ulceration of the mucous membrane except on the posterior surface, just at the edge of the thickening, two and half inches from the pyloric ring. On section the thickening appeared to be chiefly in the submucosa and muscular coats. It was of a pale yellowish colour, and was very firm. It had the appearance of a scirrhus carcinoma. The peritoneum, both visceral and parietal, was dotted over with a number of small, white nodules, the majority of which were not larger than an ordinary pin's head. They were white and opaque, and at first looked like tubercles. On closer inspection, however, they had the appearance rather of small secondary deposits of growth. They were not yellow, and had not quite the shape of tubercles. In the mesentery, and projecting from it, were several nodules much larger in size, some of them as big as, and some larger than peas. A very few old caseous, mesenteric glands were found. The liver weighed forty-two ounces, and was healthy. The spleen weighed two and half ounces, and showed a few small patches of capsulitis on its surface. There was recent lymph on the surface of the diaphragm on the right side of the chest, and on the base of the left lower lobe. There was some hypostatic broncho-pneumonia, the bronchial tubes being filled with muco-pus. There was no pericarditis. The heart weighed six ounces, and the endocardium of the left ventricle had a thickened and opaque appearance. The valves were normal. The kidneys also were normal. The supra-renals were normal. Histologically, the growth was a spheroidal-celled carcinoma with abundant stroma. See *Insp.*, 1899, No. 299.

CASE 288. *Carcinoma of the pyloric half of the stomach. Microscopical secondary deposits in liver.*—Charles M., æt. 45, was admitted for pain in the abdomen and loins, under Dr. Pye-Smith, on August 2nd, and died on September 3rd. The patient had rheumatic fever when nineteen years of age. His present illness began three weeks ago with swelling in the calves of the legs and great pain in the hypogastrium which, later, travelled to the epigastric and lumbar regions. On admission a firm tumour was felt on the left side of the abdomen descending one and a half inches below the costal margin. The note over the tumour was dull. On August 9th, the patient has vomited several times and the tumour remains tender and painful. On August 17th the tumour has increased in size, reaching to within half an inch of the umbilicus and across the middle line to the right hypochondrium. On this side a firm nodule could be felt. A diagnosis was made of carcinoma of the liver. On September 2nd, the tumour reached below the umbilicus whilst the patient lost flesh rapidly. On the next day he died. It was thought from the presence of vomiting that the primary growth was situated probably in

the stomach. When the stomach was examined it was found that it was adherent to the under surface of the liver, and that the liver itself on its under side was invaded by growth. The growth was extensive and ulcerated. It involved the whole of the anterior surface of the stomach and part of the posterior surface. It began close to the cardiac end of the lesser curvature and extended to within an inch of the pylorus. It had a bold, lobulated outline. There was gangrene affecting principally the anterior part. It invaded the great omentum which was puckered up and on the left side formed a thick band below the edge of the liver, and it was no doubt this band of thickened omentum which had been taken for the enlarged left lobe of that organ. On the right side also the omentum was involved and here at its margin there was a nodulated mass of growth which had been felt during life. The glands in the portal fissure were full of growth, very soft and hæmorrhagic on section. Many lymphatic glands contained secondary growths. The spleen was soft and flabby, and the liver was apparently free from deposit. The supra-renal capsules were normal. There were no secondary deposits in the lungs or thoracic viscera. The pericardium was universally adherent, but separated without laceration of the heart muscle. The kidneys were pale and scarred but otherwise normal. The gall-bladder was normal. "The growth in the stomach histologically examined," says Dr. Perry, "is an exceedingly cellular one consisting of epithelial cells, with scanty stroma lying in large spaces without trace of columnar lining—in fact a spheroidal carcinoma with very scanty stroma. In the liver there are deposits of similar epithelial cells lying in foci among the hepatic cells, but quite without trace of encapsulation." *See Insp.*, 1899, No. 311.

CASE 289. *Carcinoma of the stomach invading the liver. Secondary deposits in lymphatic glands.*—William H., æt. 33, was admitted under Dr. Hale White on May 24th, 1899, for wasting, anæmia, and pain on the right side of the chest and tenderness in the left hypochondrium. He died on September 5th. Had been in the Royal Navy abroad and returned to England in November, 1898, since which time he has suffered from vomiting and has wasted a good deal. On admission, temperature 98·6°, pulse 76, respiration 22. Fulness and tenderness to the left of the epigastrium. Other systems normal. June 2nd, definite tumour felt in the left hypochondrium with hard lower margin and extending into the epigastrium. Patient vomited continually. The vomit gave several negative tests for hydrochloric acid and a positive one for lactic acid. The tumour gradually increased in size with extreme tenderness and the patient got worse. Had continued diarrhoea and vomiting. Had daily injections of morphia. At the autopsy a large growth was found occupying the posterior and anterior walls of the stomach commencing at the pylorus and extending to within two inches of the cardiac end. The pylorus admitted the passage of the index finger. The glands in the neighbourhood of the stomach and pancreas shewed secondary deposits. The under surface of the left lobe of the liver was invaded by growth, apparently by direct contact as this part was immediately adjacent to the growth, which, however, did not extend into the liver substance. Gall-bladder, pancreas, supra-renal capsules, thoracic viscera and kidneys normal. *See Insp.*, 1899, No. 314.

CASE 290. *Carcinoma of the pylorus and lesser curvature of the stomach.*—Annie C., æt. 52, was admitted for pain in the epigastrium and vomiting, under Dr. Taylor, on August 3rd, and died on September 3rd. There is no history of growth in the family. Her present illness began a month ago with pain in the region of the stomach, which was constant but worse after food. About ten minutes after taking food she usually vomited. The pain has gradually become more severe and her abdomen has been distended. She has lost flesh considerably and has not suffered from hæmatemesis. On admission a hard, nodular mass could be felt in the left hypochondrium and in the epigastrium, not quite reaching as far as the middle line. The mass apparently measured two and a quarter by three and a quarter inches. The heart and other organs appeared to be normal. The patient gradually wasted and on September 4th a note was made that diarrhoea was very severe. The tumour apparently decreased somewhat in size but the patient continued to lose weight, as much as nine pounds in a fortnight. She died on September 5th. At the autopsy the hair was grey and the body was wasted. The lungs and heart were small. When the stomach was opened it was found to be of normal size but towards the pylorus a pyriform mass was discovered, which was found to be a growth attached to the lesser curvature and extending about equally on the anterior and posterior walls of the viscus. The attachment was about three inches in length, in each direction. On section there was a prominent hollow growth and next to this a large mass divided by a deep fissure, the greater part being on the posterior surface. On the lesser curvature there was puckering of the omentum, and contraction, but no secondary deposits were seen. The section of the growth shewed a white material with areas of caseation and a very scanty juice could be squeezed out of it. The peritoneum was normal. The liver weighed forty-two ounces and contained no secondary deposits. The gall-bladder, pancreas, lymphatic glands, spleen, supra-renal capsules and kidneys were healthy. The growth in the stomach is a columnar epithelial carcinoma of Ziegler, though many of the alveoli are without spheroidal cells filling up the central portions, being lined purely with columnar epithelium. See *Insp.*, 1899, No. 316.

CASE 291. *Colloid carcinoma of the stomach and peritoneum.*—James K., æt. 58, was admitted for swelling of abdomen and feet on July 17, 1899, under Dr. Pye-Smith, and died on September 28th. In March, 1899, he began to vomit about two hours after meals. No pain. He has gradually lost weight, and the abdomen and feet began to swell about three weeks before admission. On admission, pulse 68, respiration 18, temperature 98°. Thin and wasted. Abdomen distended and tense, evidence of fluid. Both legs cedematous. Unable to take solid food. August 8th, ten pints of clear fluid drawn off from the abdomen. Hard, tender, indefinite tumour felt in the left epigastric and hypochondriac regions. Moves with respiration. Patient gradually got worse with frequent attacks of vomiting. Little pain. Was tapped several times. At the autopsy there was old pleurisy over the right lower lobe and antemortem clot in the branch of the pulmonary artery to the right middle lobe, with large areas of infarction. No secondary deposits in the thorax. Heart normal. Aorta somewhat atheromatous. The stomach was small, its walls infiltrated everywhere by a colloid growth about one and half inches in thickness which had invaded the peritoneum, extending all over it and along

its attachments, matting down the whole of the intestine. The omentum was infiltrated, being nearly two and a half inches in thickness, covering the intestine like a huge apron. The under surface of the diaphragm was also affected as were the capsules of the spleen, liver, and kidneys, the growth being everywhere where the peritoneum was, but in no place were the underlying viscera invaded, and there was no stenosis or ulceration of the gastrointestinal tract. There was a considerable quantity of clear straw-coloured fluid in the peritoneum. See *Insp.*, 1899, No. 349.

CASE 292. *Diffuse carcinoma of stomach and lower end of œsophagus. Secondary deposits in pancreas, peritoneum and lymphatic glands. Venous thrombosis.*—Joseph L., æt. 54, was admitted under Dr. Bryant on September 22nd, and died on November 14th, for dyspnoea and swelling of the abdomen. His mother died of cancer. Has had varicose veins for years. Has had œdema of the lower extremities for six or seven weeks. Has brought up his food. On admission, legs much swollen. On the right, a depressed, sloughing ulcer on the inner part of the left foot. The internal saphenous veins on either side are much enlarged and tortuous. Varicose veins on both legs. Abdomen uniformly distended. Some enlarged surface veins. Moved well. Well-marked thrill. Heart irregular. No bruits. Knee-jerks absent. On October 4th, right leg swollen, toes blue, œdema marked. 5th, general thrombosis suggested as cause of condition. 15th, patient brought up his food. 25th, veins over the distended abdomen much dilated. Blood moving upwards. Patient has bad diarrhœa. November 3rd, abdomen more bulged in flank. 9th, patient has difficulty with his breathing. 12th, swelling of legs has gone down a good deal. 14th, patient suddenly worse last night, and died at 11 a.m. this morning. At the autopsy, the body was much wasted, and there were large ulcers, covered with unhealthy-looking granulations on both legs. In the chest there were fifteen ounces of clear serous fluid on the left side, and four ounces on the right side, and the bases of the lungs were considerably compressed. A number of small, white nodules of growth could be seen just beneath the pleura along the course of the lymphatic vessels. There were no secondary growths in the lung itself, or in the thoracic glands. The outer surface of the pericardial sac was covered with a number of small nodules of secondary growth. No pericarditis. Several nodules of growth on the surface of the heart about the size of a pin's head. The heart weighed three hundred and twenty-six grammes, and the muscles and the cavities had a normal appearance. Two of the aortic cusps had masses of vegetation, each about the size of a pea, readily detachable. The internal iliac veins were pressed upon by a large mass of malignant glands. Both common iliac veins were thrombosed, and the thrombus extended on both sides to the saphenous vein. The peritoneal cavity contained over a pint of dark brown, opaque-looking fluid. The peritoneum covering the intestines was studded with innumerable nodules of very pale yellowish growth, varying in size from a pin's head to a large pea. They were a good deal matted together. It was found that the stomach was the primary seat of the growth. The growth was diffused, and had infiltrated practically the whole of the organ, which was very small. The lesser curvature measured four inches, the greater curvature eight and a quarter inches. Its length was five and a-half inches, and its breadth one and three-quarter inches. The growth had invaded the

last inch of the œsophagus. The cardiac orifice was considerably stenosed. The growth did not appear to have reached the pyloric ring by quite three-quarters of an inch, the pylorus being free. The mucous membrane on the middle of the organ appeared to have been particularly affected, there being a rather large fungating mass of growth about a quarter of an inch in thickness, projecting into the lumen of the organ. The walls were much thickened, and presented a deep white colour on section. The capacity of the organ was very diminished; it appeared to hold about three or four ounces. The mesentery was very thick and hard, being infiltrated with growth, and was also much contracted. The liver contained no secondary deposits. The gall-bladder was normal. The pancreas was infiltrated with growth. The lymphatics were enlarged with secondary deposits. Supra-renal capsules normal. Kidneys slightly scarred. A section of the growth of the stomach shewed chiefly fibrous tissue, which contained tubules and alveoli, containing large, spheroidal-shaped cells. In many parts of the section there was also small celled infiltration. "I also saw," says Dr. Bryant, "areas consisting of groups of spheroidal cells, surrounded by small round cells." *See Insp.*, 1900, No. 4.

CASE 293. *Carcinoma of the pyloric end of the stomach and duodenum. Gastro-jejunostomy. Empyema. Secondary deposits in liver and lymphatic glands.*—William C., æt. 64, was admitted under Mr. Dunn on January 15th, 1900, and died on February 10th. The patient had been suffering from indigestion since March, 1899, and for the last three months has vomited nearly everything he has eaten. On admission he was much emaciated. The vomit consists partly of digested food, and partly of frothy liquid. January 15th, gastro-jejunostomy performed. Since then the patient has taken plenty of nourishment, and complained of no pain. He passed the Murphy's button on the 13th day after the operation. February 7th, the patient complained of pain at the base of the right lung. There was dullness behind and in the axilla. He seemed fairly well on the evening of the 9th, but at 6 a.m. on the 10th he sat up in bed to take his medicine, and fell back dead. At the autopsy the portion of duodenum attached to the stomach was firmly united over an area about one and quarter inches in diameter. The jejunum had been passed through the great omentum, and attached on to the posterior surface of the stomach just above the greater curvature, at a distance of two inches from the pyloric end of the growth. The opening between the stomach and jejunum was the size of a shilling. There was no sign of any peritonitis, nor any collection of pus in the abdominal cavity anywhere. There was, however, on the right side of the chest an empyema containing thirty ounces of pus. The abscess cavity corresponded to the posterior and lateral aspect of the lower lobe. It was lined by a thick, gelatinous-looking membrane. The pus was very foul. There were no secondary deposits in the thoracic viscera. The heart weighed two hundred and ninety-eight grammes, and was normal. Occupying the pyloric region of the stomach was a large mass of growth measuring ten centimetres long, and three centimetres in thickness. It involved all the coats of the stomach, and had spread through to the under surface of the liver in the region of the transverse fissure, so that the stomach was firmly adherent thereto. The glands in this region were all enlarged and filled with growth. The lesser omentum and pancreas

were also involved in the mass. On the inner surface the growth projected in an irregular manner into the interior. The edges were not so well defined as usual, extending distally into the duodenum, and so rendering it impossible to exactly define the pylorus. Apparently it was in the centre of the growth. The peritoneum was normal. The liver weighed one thousand six hundred and fifty grammes, and showed numerous secondary deposits of growth scattered through its substance. They were white and hard, some as large as a sixpenny-bit, and some not as large as a pea. The gall-bladder and pancreas were normal. Some of the mesenteric glands contained deposits of growth. The spleen weighed one hundred and sixty-five grammes and was normal. The supra-renal capsules and kidneys were normal. *See Insp.*, 1900, No. 61.

CASE 294. *Carcinoma of the pyloric end of the stomach. Gastrectomy. Broncho-pneumonia. Secondary deposits in lymphatic glands.*—Albert N., æt. 42, was admitted under Dr. Pitt on January 22nd, 1900, for vomiting after food and epigastric pain with intermittent albuminuria. He died on February 15th. The family history was good. Eighteen months ago the patient had rheumatic fever and pneumonia. Fifteen months ago noticed dyspnoea on exertion. Epigastric pain. In September, 1899, he saw a physician, who ordered him medicine and a complete rest in the country. Three weeks after, he began vomiting every evening at about seven o'clock. The vomit was bitter and coffee-coloured. No hæmatemesis. He has lost two stone during the four months preceding admission. On admission the right side of the abdomen was found to be more rigid than the left. No tumour could be felt. Succussion splash obtained. January 25th, no hydrochloric acid in the vomit. February 8th, Mr. Dunn operated. He removed the pyloric two-thirds of the stomach and attached the duodenum by means of a Murphy's button. February 12th, a rub was heard on the right side of the chest. February 15th, much weaker and semi-comatose and delirious. He died about 1.30 p.m. At the autopsy the body was wasted and there were general fibrous adhesions of both pleuræ most marked at the bases, the right lung being there very adherent to the upper surface of the diaphragm. There was extensive broncho-pneumonia. The heart weighed three hundred and eighty-four grammes. The wall of the right ventricle was thin and pale and the cavity was dilated. The left ventricle not dilated. The pyloric two-thirds of the stomach had been removed and the end firmly stitched. The cut end of the duodenum had been attached to the anterior surface of the stomach by means of a Murphy's button. The Murphy's button could not at first be found but was subsequently discovered in the rectum. A very little manipulation caused the duodenum to be separated from the stomach, the adhesions between these two surfaces being of a very fragile nature. Apparently during life they had not become separated, as there was no evidence of peritonitis, nor was there any evidence of stomach contents being present in the peritoneal cavity. The liver weighed one thousand four hundred and twenty-one grammes, and was pale and fatty-looking. There were no secondary deposits in the abdominal glands. The spleen was normal and weighed two hundred and eighty grammes. Supra-renal capsules normal, and the kidneys weighed three hundred and eighty-five grammes, had a pale, mottled, rather lobulated surface and a small cyst in the cortex. Histologically the growth was a

scirrhus carcinoma. The section of the liver was identical in appearance with a section of a nutmegged liver. The section of kidney showed a good deal of fibroid change in the interstitial tissue. The arteries were thickened; so were the capsules of the glomeruli. *See Insp.*, 1900, No. 69.

CASE 295. *Chronic ulcer of stomach becoming carcinomatous. Stricture of pylorus. Gastro-jejunostomy. Secondary deposits in peritoneum and pancreas.*—Alfred D., æt. 38, was admitted, for pain in the abdomen and vomiting, under Dr. Pitt on April 20th, 1900, and died on May 8th. No family history of malignant disease. The patient has been a heavy drinker, and has suffered from indigestion for some years. During the last two or three months he has lost two stone in weight. The amount of the vomit has increased very much in quantity; the vomiting taking place usually about from four to eight hours after food. On admission pulse 80, temperature 97·2°, respiration 18. Patient is wasted: signs of a dilated stomach: no tumour felt. Total acidity ·05. The stomach was washed out daily. On May 7th Mr. Dunn performed gastro-jejunostomy. At the time of the operation a nodular growth could be felt at the pylorus. The patient died on the following day at 8.40 a.m. At the autopsy the body was much wasted and both lungs were œdematous. There was a good deal of hæmorrhage into the tissue of both organs, occurring in patches of varying size. There were no secondary deposits in the thoracic viscera. The heart weighed two hundred and twenty-five grammes, and was normal. The stomach was dilated and the walls were much thickened and hypertrophied. The Murphy's button was found securely connecting the upper part of the jejunum with the anterior wall of the stomach near the greater curvature, and at the junction of the right with the middle third of that organ. The pylorus could be felt to be very hard and thickened and a close inspection of the peritoneum covering the lesser curvature showed the presence of a number of small, hard, white nodules of secondary malignant growth. On opening the stomach the pylorus was found to be very tightly constricted by what appeared to be fibrous tissue. Three centimetres above the pyloric ring on the lesser curvature was a large chronic ulcer measuring seven by three centimetres. The floor of it was smooth and formed of fibrous muscular tissue; the edges much thickened and slightly everted. Around the ulcer the stomach wall felt very hard and indurated as if infiltrated with growth. "I came," says Dr. Bryant, "to the conclusion from the microscopic appearance of the pylorus and the ulcer that it was a chronic ulcer becoming malignant." A few small nodules of secondary growth were found in the mesentery. The liver weighed 1,430 grammes and was normal. There was a small, hard nodule of growth in the tail of the pancreas. The gall-bladder, spleen, supra-renal capsules and kidneys were healthy. Histologically the growth in the stomach was a cylindrical carcinoma. The epithelial cells were columnar and many of them had undergone marked fatty degeneration. Many of the cancerous tubules showed only a lining of columnar cells whilst in others, the lumen of the tube was filled with cells. The adjacent fibrous tissue was infiltrated with columns of cells and with cells having a distinctly tubular arrangement. *See Insp.*, 1900, No. 177.

CASE 296. *Carcinoma of the pyloric end of the stomach. Gastro-jejunostomy. Peritonitis. Secondary deposits in pancreas.*—Henry H., æt. 51, was

admitted under Mr. Symonds on May 9th, 1900, with a history of dyspepsia and vomiting lasting five weeks. He died on May 13th. All food taken by the mouth has been vomited up and the patient has lost much flesh. No hæmatemesis. On admission a tumour can be felt above the umbilicus in the middle line extending over to the right. Mr. Symonds diagnosed pyloric growth. On May 10th gastro-jejunostomy was performed. On the 11th the patient was not doing well and transfusion was performed in the night. On the following day the patient died. At the autopsy the pyloric end of the stomach was involved in a growth so that its wall was thick and hard. The growth ceased suddenly at the pylorus. The index finger could be passed through the pylorus after dilating it gradually with the tip. The jejunum was found connected by a Murphy's button with the cardiac end of the stomach. The wall of the jejunum, however, had slipped away at one point or become pulled away so that there was a leakage and some of the contents were found in the peritoneum, with peritonitis. On examining the button from the stomach aspect, the lumen was seen to be full of a large number of grape stones. There were no secondary deposits in the liver. The gall-bladder was normal. The head of the pancreas was involved in the growth. The lymphatic glands were free from growth. The spleen and supra-renal capsules were normal. The right lobe of the thyroid was divided into two lobes, superior and inferior. Each of these consisted of a thick walled cyst, one to two inches in diameter containing a brown fluid. The kidneys were normal. *See Insp.*, 1900. No. 183.

CASE 297. *General carcinomatous infiltration of the stomach. Chronic peritonitis. Secondary deposits in glands. General anasarca.*—John E., æt. 66, was admitted for general emaciation and ascites, under Dr. Fawcett, on April 9th, 1900, and died on June 9th. The patient has felt weak since last Christmas, being sick after his food but having no hæmatemesis. He has complained of pain in the left hypochondrium. A little later, swelling of the feet was noticed and then of the abdomen. On admission he was much emaciated, with œdema of the legs and ascites. No other physical signs of disease in any organ were detected and it was thought that his condition was due to malignant disease of the abdomen, the pancreas being most likely the primary seat. The patient gradually got weaker and the ascites became somewhat more marked and later on there were signs of effusion in both pleuræ. The right pleural cavity was tapped. He was not sick whilst in the hospital, nor did any other signs develop. It was thought that the condition was due to malignant disease in the abdomen, the exact seat being undetermined. He gradually got weaker and died. At the autopsy the body was much emaciated and there was a considerable quantity of clear serous fluid in either pleural cavity, the lungs being compressed. There were no secondary deposits in the thoracic viscera. The heart was wasted and there was slight atheroma of the aorta. The peritoneum was of a grey colour and much thickened everywhere. In the upper part of the abdomen the stomach, transverse-colon and liver were firmly matted together. The stomach was also united to the colon below by a shrunken and much thickened great omentum. Posteriorly the pancreas and surrounding tissues were also matted up through chronic peritonitis, most marked in this region. The stomach itself was separated from its adhesions with some difficulty. It was a very small organ with hypertrophied walls, the

coats very distinctly marked off from one another. The hypertrophy seemed chiefly to affect the mucous membrane and the muscular coat. At the pyloric extremity the wall was 1·25 centimetres thick and in the middle of the greater curvature one centimetre. About one centimetre within the pylorus there was an irregular and depressed scar, "which," says Dr. Fawcett, "I took to be an old healed ulcer." Some of the retro-peritoneal glands above the pancreas showed numerous secondary deposits and were enlarged. The coat of the intestines was much thickened by chronic peritonitis but otherwise unchanged. The capsule of the liver was thickened, the organ itself being free from secondary deposits. The gall-bladder, pancreas, spleen, supra-renal capsules and kidneys were normal. Histologically the stomach was found to be infiltrated throughout by scirrhus, spheroidal-celled carcinoma. In the sub-mucous coat there is a great amount of fibrous tissue. In the muscular coat the fibres are separated also by masses of deposit. A similar growth was found in the lymphatic glands but containing considerably less fibrous tissue. See *Insp.*, 1900, No. 216.

CASE 298. *Carcinoma of the cardiac end of the stomach. Gastrostomy.*—Alice P., æt. 37, was admitted for difficulty in swallowing, under Dr. Taylor, on May 16th, 1900, and died on June 11th. The patient first noticed pain in the stomach associated with indigestion and vomiting in October, 1898. At the beginning of this year she had difficulty in swallowing, and pain on the right side running up to the shoulder. She has been unable to swallow solids since January last. Attempts to pass a tube failed, the tube reaching only twelve and half inches down the œsophagus. On admission she was much emaciated, and there was some tenderness over the stomach area. Milk could be swallowed, but was soon regurgitated. Mr. Symonds was able to pass a small, olive-headed bougie into the stomach. On June 4th, gastrostomy was performed with temporary relief, but the patient gradually got weaker and died. At the autopsy the heart was much wasted, the rest of the thoracic viscera being normal. The stomach was very much shrunken and thickened. It was tucked up under the surface of the left lobe of the liver, and firmly fixed to its under surface, so that it had to be cut away with a knife. The spleen was also so tightly united to its cardiac end that it also had to be cut away. On the dorsal surface, the neighbouring tissues with the pancreas were firmly matted together, and to the stomach. The stomach measured 10·25 centimetres in its greatest length. On opening the organ a large irregular ulcer was seen extending from the cardiac orifice, and spreading out along the wall to a distance of eight centimetres. Over the area occupied by the growth the walls were thickened and infiltrated, measuring half a centimetre in thickness. Distal to this the walls were also thickened throughout, but not so much so as over the growth area. The gastrostomy wound was within half an inch of the pyloric orifice, and opposite to it was a recent ulcer two centimetres in length, and about half that in breadth. It extended through the mucous membrane, and the edges of it were infiltrated by recent blood extravasation. "This ulcer," says Dr. Fawcett, "I thought might have been produced by the silver tube placed in the stomach." On the peritoneal surface were a few secondary deposits the size of small peas, but none elsewhere. From the upper end of the growth the ulceration extended superficially about half a centimetre along the œsophagus, but the wall of

that tube was not infiltrated. The situation of the growth, as shown in the diagram, is at the cardiac orifice, and extending about three inches along the lesser curvature, and six inches along the greater curvature, including therefore the fundus of the organ. The gall-bladder, pancreas, and lymphatic glands were normal. The capsule of the spleen was thickened, and firmly adherent to the cardiac end of the stomach. It was normal on section. The supra-renal capsules and kidneys were normal. Histologically, the growth was a scirrhus, spheroidal-celled carcinoma, infiltrating all the coats. *See Insp.*, 1900, No. 217.

CASE 299. *Carcinoma of the pylorus invading the liver. Secondary deposits in liver and in bronchial and mesenteric glands.*—Mary H., *et.* 44, was admitted for painful abdominal swellings, under Dr. Taylor on March 10th, 1900, and died on July 10th. In December, 1899, the patient noticed a swelling in the epigastrium. This was soon followed by vomiting after meals, the vomit being of a coffee-ground colour. Early in February of the present year a second painful swelling was noticed in the left hypochondrium. The vomiting became more frequent. For the last two months she has lived on slops. Constipation was present with blood in the motions. Wasting. On admission a hard painful swelling three inches by two inches in the left hypochondrium, and another about an inch in diameter just below the ensiform cartilage. The liver was felt one inch below the costal margin. Throughout April the patient remained in much the same condition. May 8th, a second nodule was felt in the edge of the liver just to the left of the umbilicus. On the 16th great pain along the sternum on swallowing. Wasting very marked. Jaundice present. June 4th, oedema of the ankles noticed. Patient becoming more drowsy. She got weaker, with muttering delirium, and at times drowsiness. July 10th, the patient died, having been more or less comatose for a week. At the autopsy the brain weighed nine hundred and thirty-two grammes and was normal. Both the pleural cavities contained a moderate quantity of fluid, two hundred and fifteen cubic centimetres on the right side and five hundred and six on the left. The lungs were somewhat compressed. The bronchial glands contained some secondary deposits. The heart was small. There was a large breaking-down growth at the pyloric end of the stomach. It was sharply defined towards the pylorus and extended back from this point along both surfaces of the stomach to a distance of five centimetres. The inner surface of the stomach is ulcerated and presents a warty appearance. The coats of the stomach are thickened by an infiltration of growth. The pyloric extremity of the stomach is adherent to the transverse fissure of the liver, and the growth extends directly into the liver from this point. The glands in this region are enlarged and infiltrated with growth. The intestines are normal. The peritoneum contained 2,712 cubic centimetres of turbid fluid. The liver was enlarged and contained numerous secondary deposits varying much in size, some of them being quite soft especially in their central portions. There was a large secondary deposit around the neck of the gall-bladder. The pancreas was normal. The lymphatic glands contained many secondary deposits. The spleen weighed one hundred and twenty-two grammes, and was normal. The supra-renal capsules and kidneys were normal. A secondary deposit in the liver was histologically a typical spheroidal-celled carcinoma, and presumably therefore the growth in the stomach was of the same character. *See Insp.*, 1900, No. 253.

CASE 300. *Carcinoma of the cardiac end of the stomach. Secondary deposits in liver and lymphatic glands. Pleurisy.*—John L., æt. 68, was admitted under Dr. Perry on May 21st, 1900, for inability to take solid food and wasting; he died on July 13th. His illness began in December of the previous year when he had difficulty in keeping down solid food. For six months he has lived entirely on liquids. He has lost four stone in weight. On admission the abdominal wall was rigid and the liver could be felt two inches below the costal margin, with its surface irregular. There was tenderness of the epigastrium and over the ninth and tenth dorsal spines. Dulness two and a half inches below the costal margin in the nipple line, and three inches below the ensiform cartilage. No pain. Food, if taken, is immediately regurgitated. Slight constipation. May 29th: A bougie passed for seventeen and a quarter inches. On June 2nd a slight hæmoptysis. June 7th: Takes solid food occasionally; is losing about two pounds per week. 18th: Nodule felt in lower border of right lobe of liver. 21st: Another lump felt in the epigastrium. 29th: Liver very tender. July 5th: Two inches below the umbilicus three nodules can be felt. On the 7th he became collapsed but improved with brandy. The liver was three inches below the umbilicus. No food, solid or liquid, is now retained and for the rest of his life the patient was given nutrient enemata. At the autopsy the body was much wasted and there was recent pleurisy over the posterior surface of the right lower lobe. There were old adhesions on both sides and purulent fluid in the basal bronchial tubes. There was cedema of the right lung. The pericardium was firmly bound to the lower end of the œsophagus by adhesions, and the pericardium contained a small quantity of clear yellow fluid. The heart weighed two hundred and seventy-eight grammes. The muscle was pale and shewed white areas of fatty degeneration. There was some atheroma of the aorta. The junction of the œsophagus with the stomach was invaded by a soft, ulcerated, fungating growth. This region of the œsophagus was firmly bound to the pleuræ and pericardium, and in the tube above the lower end was a dilated vein. At the cardiac end of the stomach was a soft growth which encircled the orifice and reached about three inches all around on the walls of the stomach. It admitted the index finger. On laying it open it was seen to be ulcerated. The stomach was small; the intestines were congested; the peritoneum contained a small quantity of fluid. The liver weighed one hundred and ten ounces, and was almost entirely composed of growth, the largest and most broken down nodule being on the anterior border of the right lobe. The bile-duct was patent. The gall-bladder and pancreas were normal. Many of the lymphatic glands behind the stomach were invaded by secondary deposits. The spleen weighed 100 grammes and was normal. The supra-renal capsules and kidneys were normal. The growth in the stomach was carcinomatous. See *Insp.*, 1900, No. 256.

CASE 301. *Carcinoma of the pylorus. Exploratory laparotomy. Peritonitis.*—Robert B., æt. 32, was admitted under Dr. Bryant, on July 16th, 1900, for pain in the abdomen after solid food, flatulence and vomiting. He died on July 23rd. The illness began last Christmas, with attacks of pain in the abdomen, increasing in frequency and severity. He was treated for dyspepsia and gastric catarrh. When seen by Dr. Bryant at Out-patient's, he presented an abdominal tumour in the epigastric region, and a diagnosis of

carcinoma of the stomach was made. "From its position and size, and from the absence of signs of pyloric obstruction," says Dr. Bryant, "I thought possibly that it was a diffuse growth in that organ." On admission, temperature 98.8°, pulse 60, respirations 80. Very anæmic and weak. A tumour was felt in the epigastrium. There was an area of tenderness around it. On the 17th, Mr. Dunn saw him, and advised an exploratory operation. The operation was performed on the 19th, and a growth was found, so large and adherent, and so infiltrating the liver, that it was not thought advisable to attempt its removal. As there was no pyloric obstruction, Mr. Dunn did not think it advisable to perform a gastro-jejunostomy. After the peritoneal cavity had been opened, Mr. Dunn felt a spherical hard lump of what at first, he thought, was a secondary growth invading the umbilicus. This, however, proved to be a concretion. He feared that it might possibly lead to peritonitis. The patient never did well after the operation, and died with signs of peritonitis. The body was anæmic and wasted. The pleuræ and lungs were healthy. There were some gas-containing cysts beneath the pleura. The heart weighed three hundred grammes, the right ventricle appearing to be a little hypertrophied and dilated. The pericardium in this part was covered with a thick layer of fat, which had also infiltrated the myocardium. The stomach was not dilated. The pylorus was very firmly adherent to the under surface of the right lobe of the liver, and there was a large malignant growth of the pylorus. It was sharply limited below by the pyloric ring, the duodenum not being at all implicated. There was no pyloric obstruction, although the end of the stomach was uniformly affected. The mucous membrane was ulcerated at the parts corresponding to the growth. The growth was not very hard. On section, it was white, and looked something like brain substance. The intestines were normal. There was general acute peritonitis, the upper part of the peritoneal cavity being most affected, the liver, stomach and colon being covered with thick flakes of yellow lymph. The liver weighed one thousand and fifty grammes, was pale and fatty. The gall-bladder, pancreas and lymphatic glands were normal. The spleen was normal. Supra-renal capsules normal, and kidneys also. Histologically, the growth was a columnar-celled carcinoma of the stomach. The section consisted almost entirely of epithelial growth, there being very little fibrous tissue. *See Insp.*, 1900, No. 269.

CASE 302. *Carcinoma of pylorus and lesser curvature of the stomach. Gastro-jejunostomy. Gangrene of lung.*—George B., æt. 49, was admitted under Dr. Hale-White on April 9th, 1900, for pain after food, vomiting and wasting. He died on July 27th. In October, 1899, he began to suffer with pain in the abdomen after meals. After Christmas the pain got worse, extending up to his throat. February, 1900, vomiting began. Appetite very bad and weight fell from eleven stone seven pounds to eight stone. On admission a rounded tumour was seen and felt occupying the whole of the epigastric region and extending below the umbilicus. It was resonant and a succussion splash was present. Diffuse carcinoma of the stomach was diagnosed. On May 9th, gastro-jejunostomy was performed. The vomiting ceased after the operation and the patient improved very much. June 18th, rales heard at the bases with bronchial breathing at the left and a pleuritic rub at the angle of the right scapula. The

breath was very foul. The patient gradually became weaker and died. At the autopsy there was recent pleurisy over the right lower lobe and the left pleura was adherent by dense fibroid tissue. Both lungs showed a condition of diffuse, septic, broncho-pneumonia more advanced in the right lung than in the left. The condition was thought by Dr. Fawcett to be due to inhalation of food. The glands were soft. The pericardium normal. The heart normal. A large ulcerated growth of the pyloric end of the stomach was discovered extending along the whole length of the lesser curvature and along about one third of the greater curvature. The coats were infiltrated throughout and much thickened. Towards the pylorus the growth was sharply limited, not extending into the duodenum. The commencement of the jejunum was firmly attached to the greater curvature of the stomach posteriorly. The opening through the stomach wall just admitted the little finger. The Murphy's button was lying in the stomach cavity. The peritoneum was normal; also the liver, gall-bladder, pancreas, lymphatic glands, spleen, supra-renal capsules, and kidneys. See *Insp.*, 1900, No. 272.

CASE 303. *Carcinoma of the pylorus and lesser curvature of the stomach.*—Seth F., æt. 63, was admitted on May 26th, 1900, under Dr. Pitt, for abdominal pain and wasting. He died on September 22nd. In July, 1899, he noticed that he was losing flesh, and had sharp attacks of abdominal pain, with some swelling of the legs, and dyspnoea on exertion. The symptoms have continued more or less since then. On admission he was much wasted and anæmic, and complained of abdominal pain. The abdomen was retracted, and a very movable nodulated tumour could be felt in the right epigastric region, which descended with inspiration. The tumour reached to the umbilicus, was roughly oval in shape, measuring six inches by four and half inches. The liver was not enlarged. The patient was dyspnoic. The urine had a specific gravity of 1020, acid, no albumen or sugar. May 29th, Dr. Pitt thought the mass was in connection with the stomach. June 19th, red corpuscles, 2,200,000; white, 3,500; hæmoglobin, 24 per cent. He gradually became worse, constantly complaining of abdominal pain, and died on September 22nd. The temperature was irregular, but never high. At the autopsy the lungs were emphysematous. The stomach shewed a large mass of growth at the pyloric end occupying the lesser curvature. It measured five inches by three and a half. Does not include the whole circumference, and does not obstruct the passage of food, as the finger can easily pass into the duodenum. On its internal aspect large nodules were seen, but very little ulceration. The outer wall of the stomach is not perforated, nor the pancreas invaded. One affected gland was found. The intestines, liver, gall-bladder, pancreas, spleen, supra-renal capsules, were all normal. The kidneys showed interstitial nephritis. Histologically the growth in the stomach was a carcinoma. See *Insp.*, 1900, No. 845.

CASE 304. *Chronic ulcer of pylorus becoming carcinomatous. Pyloric stenosis. Gastro-duodenostomy.*—George M., æt. 43, was admitted for pain in his abdomen and vomiting, under Dr. Perry on October 26th, 1900, and died on November 15th. There is no history of cancer. The patient has always lived at Cliffe where malignant growth is said to be very prevalent. As a young

man he used to drink heavily, but for the last three years has been very abstemious. He has always been subject to pains in the abdomen. During the last five years the pain has been more acute and he has vomited a good deal. The patient has lost fourteen pounds during the last five months. On admission he was much wasted and very dark-skinned. His vomiting has hardly any relation to food. Pain in epigastric region of a dull aching character. Patient has never vomited any blood nor passed any in his motions. Abdomen rather dark in colour, not full. Peristalsis can easily be seen passing from the left to the right over the region of the stomach. There is a slight bulging in the epigastric and left hypochondriac regions. There is a well-marked succussion splash. In the right hypochondriac region external to the rectus muscle a hard tumour can be felt, which is movable. Resonance increased. Liver not palpable, nor spleen. Respiratory and circulatory systems normal. Examination of vomit :—Free hydrochloric and lactic acid present ; undigested food, fat-globules, starch grains, and sarcinæ ventriculi. October 29th : Patient not vomited since the 26th, when he was washed out. November 1st : Patient ordered to be washed out every day. November 6th : Mr. Fripp operated and the stomach was found to be dilated. The pylorus appeared to be stenosed, probably from an old ulcer. A gastro-jejunostomy was performed. 8th : Patient has vomited once or twice. 10th : Not so well ; pulse weaker. Mr. Fripp suggested washing out the stomach but the patient refused. 12th : Patient seemed much better ; wound in excellent condition. 13th : Patient has not vomited to-day. 15th : He is much better with a normal temperature. He died very suddenly. At the autopsy the body was fairly well nourished, and the abdominal wound was healed. The brain was healthy. There was no pleurisy. The lungs were normal. The heart also. The œsophagus was a little thickened at its lower extremity. The stomach was very much dilated. The third part of the duodenum was attached to the anterior and lower part of the pyloric end of the stomach about three inches from the pylorus. The attachments were quite firm. The attached part of the duodenum appeared to be twisted and the proximal part was sharply bent and pressed on by a band of mesentery, so that it appeared to be impossible for any of the stomach contents which had passed into the duodenum directly to pass back along the duodenum into the stomach again. The part of the duodenum above the anastomosis was much distended, as also was the stomach. The stomach was filled with a large amount of greenish-coloured fluid. A large ulcer measuring 6·35 centimetres by 3·75 centimetres was seen on opening the stomach just above the pylorus on the posterior wall at the lesser curvature. The edges were thickened and everted and the floor was hard and fibroid. There was no perforation. Externally it was firmly adherent to the gall-bladder, which was enormously thickened. In the region of the ulcer there was a good deal of thickening of the stomach walls, which on section looked very much like new growth. The pylorus was cicatrised and its orifice much narrowed. It would only just admit the tip of the little finger. The wall of the stomach was a good deal hypertrophied. Microscopical examination of the ulcer showed a large amount of fibrous tissue which in places was infiltrated with groups and tubules of columnar cells. "It was evident," says Dr. Bryant, "that a chronic ulcer had become carcinomatous." The peritoneum and liver were normal. The gall-bladder thickened. Some of the lymphatic glands were enlarged and hard. The supra-renal capsules and kidneys were normal. *See Insp.*, 1900, No. 407.

CASE 305. *Carcinoma of pyloric end of stomach, apparently developing in a simple ulcer. Secondary deposits in liver and lymphatic glands.*—Reuben H., æt. 61, was admitted for dyspepsia, vomiting and wasting, under Dr. Pitt, on November 28th, 1900, and died on December 4th. The patient was quite well until three years ago, when he had dropsy of the left leg, which came on suddenly, with pain and tenderness. For some time past he has been getting weaker; anorexia and constipation also present. On admission, anæmic and considerably wasted. There was parotitis on the left side. Abdomen distended somewhat, and the skin slightly œdematous. An irregular, hard tumour was felt occupying the upper region of the abdomen. The lower edge of it was two and a-half inches above the level of the right anterior superior spine, and three and a-half inches above the left anterior superior spine. There was œdema of the right leg. The urine contained a trace of albumen. During the time the patient was in the hospital he vomited every day, sometimes once, and sometimes two or three times. The parotitis quite cleared up, but the œdema became more marked. The anæmia and general weakness gradually increased. The vomit was dark in colour, and abundant. Throughout his illness, the vomit contained no free hydrochloric acid, nor any bacteria or moulds. At the autopsy, the body was wasted, and the femoral vein was filled with ante-mortem clot. The lungs were emphysematous, and their lower lobes œdematous. The edge of the mitral valve was somewhat thickened. The stomach appeared considerably dilated, and the coats were somewhat thin. Close to the pyloric orifice, and situated on the lesser curvature, was an irregular, nodulated, circular growth, the size of a half-crown piece. The centre of the growth was much depressed, and appeared as if it had been scooped out. The floor was smooth. The nodular mass around the edge of the ulcer consisted of a soft, white growth, with hæmorrhages into the substance. "From the naked-eye, appearance of the ulcer and its scooped out character, and its smooth floor, I thought," says Dr. Fawcett, "it was an example of a simple ulcer which had become malignant." The growth involved the walls of the stomach, the pyloric end of which was firmly tied down to the head of the pancreas by fibrous tissue. Above the ulcer, and outside the stomach, was a mass of white growth, measuring seven centimetres by two centimetres. This deposit extended into the lesser sac, and the glands here were enlarged with secondary deposit. Behind the stomach, along the course of the aorta, was a firm mass of growth somewhat compressing the vessel, and measuring twelve centimetres in length. The liver weighed four pounds sixty-one grammes, being much enlarged by numerous very soft secondary deposits, which varied in size from a pea to an orange. The deposits shewed marked umbilication, and were of pultaceous consistence. The pancreas was hard, but apparently free from growth. The intestines, gall-bladder, spleen, supra-renal capsules, and kidneys, were healthy. Histologically, the growth was a spheroidal-celled carcinoma. See *Insp.*, 1900, No. 427.

CASE 306. *Carcinomatous stenosis of pylorus. Secondary deposits in peritoneum. Chronic phthisis.*—Sarah B., æt. 45, was admitted for abdominal pain and distension under Dr. Perry, on October 17th, 1900, and died on December 5th. In April of the present year she suffered from dyspepsia and epigastric pain after food, and an increasingly distended abdomen, and

wasting. In June vomiting, and on one occasion hæmatemesis. She was tapped for ascites at St. Thomas's Hospital, with much temporary relief. On admission there was slight œdema of the feet, she was cachectic-looking, and the abdomen was much distended. Signs of fluid. October 23rd, tapped, and fourteen and a half pints drawn off. After the tapping several swellings were felt, and stomach peristalsis could be seen. Carcinoma of the pylorus, with secondary deposits in the peritoneum, was diagnosed. On November 23rd she was tapped again, and seventeen pints drawn off. She rapidly got worse on December 4th. She was tapped again at noon on December 5th, and died at 9.20 p.m. At the autopsy the body was very pale, and much wasted. The pleura was thickened and adherent all over the right lung, and there was a considerable amount of chronic phthisis. The abdomen was distended. When the peritoneal cavity was opened, the coils of intestines were seen all matted together by means of organizing lymph. In fact all the abdominal viscera appeared to be firmly matted together. On looking more closely little nodules of growth could be seen on the visceral peritoneum. On separating the coils, small cysts containing a clear, yellow fluid, or a jelly-like fluid were found. The stomach was firmly adherent to adjacent structures, and there was a good deal of thickening of the tissues all round the pylorus. The stomach was dilated. The pylorus was stenosed by a rather hard growth, and would just admit the tip of the index finger. Above the stenosis the growth was much congested, and had a markedly fungating appearance. It did not extend into the duodenum. The intestines were normal. The liver had no secondary deposits. It weighed one thousand five hundred and seventy-five grammes, and showed well-marked capsulitis. The lymphatic glands were enlarged and hard. The spleen showed capsulitis, and was enlarged, soft and diffuent. The kidneys were normal. Histologically, the growth was a typical columnar carcinoma. The spaces were lined with columnar epithelium, lying in a very dense fibrous tissue, there being a great increase in the amount of fibrous tissue present, so that it was a cylindrical carcinoma with much stroma. See *Insp.*, 1900, No. 431.

LIST
OF
GENTLEMEN EDUCATED AT GUY'S HOSPITAL
WHO HAVE PASSED THE
EXAMINATIONS OF THE SEVERAL UNIVERSITIES, COLLEGES,
&c., &c.,
IN THE YEAR 1902.

University of Oxford.

Second M.B. Examination.

Pathology.

J. M. Bickerton.	O. W. Richards.	W. E. Robinson.
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Medicine, Surgery, Midwifery, Forensic Medicine and Public Health.

O. W. Richards.

University of Cambridge.

Degree of Doctor of Medicine.

W. F. Colclough.	J. N. Gardiner.	J. H. H. Manley.
H. A. Gaitskell.	W. J. Lindsay.	

Final Examination for the Medical and Surgical Degrees.

Part I.

H. Ackroyd.	J. H. Donnell.	C. M. Murray.
W. H. Brailey.	J. Goss.	O. V. Payne.
H. M. Clarke.	C. R. Howard.	E. W. Sheaf.
H. A. Cutler.	W. M. Mollison.	G. A. Ticehurst.

Part II.

J. A. Andrews.	C. R. Howard.	H. Wachter.
H. Davies-Colley.	E. H. Kitchin.	J. A. Wood.
M. C. Hayward.	F. H. Parker.	

Second Examination for the Medical and Surgical Degrees.

F. D. Crew.	|	L. G. Davies.	|	A. S. Littlejohns.
		C. M. Stevenson.		

Examination in Sanitary Science.

G. S. Graham-Smith.	|	F. B. W. Phillips.	|	E. J. O'Meara.
W. J. Lindsay.	|	E. C. Hare.	|	J. B. Slattery.

University of London.

Examination for the Degree of Doctor of Medicine.

A. E. Clarke.	|	H. P. Ferraby.	|	G. N. Meachen.
T. H. B. Dobson.		D. G. Greenfield.		W. T. Milton.

Examination for the Degree of Master in Surgery.

H. L. Eason.		R. H. J. Swan.
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Examination for the Degree of Bachelor of Surgery.

Second Division.

W. H. Bowen.		M. Abdy Collins.		A. G. Osborn.
P. W. L. Camps.	|	Stanley Hodgson.	|	R. P. Rowlands.
		F. E. Walker.		

Examination for the Degree of Bachelor of Medicine.

May,

Second Division.

H. Barber.	|	D. Forsyth.	|	Stanley Hodgson.
J. Evans.	|	F. G. Gibson.	|	N. N. A. Houghton.
		M. J. Rees.		

October.

First Division.

R. P. Rowlands.

Obtained the Scholarship and Gold Medal in Medicine.

F. E. Walker.

Second Division.

M. Abdy Collins.

Obtained Honours in Obstetric Medicine.

W. G. Mumford.

Obtained Honours in Medicine.

K. Anderson.	|	E. C. B. Ibotson.	|	G. H. Robertson.
M. W. Cohen.	|	T. A. Matthews.	|	G. S. Robertson.
G. Evans.	|	S. J. Ormond.	|	F. L. Thomas.

Intermediate Examination in Medicine.

January.

Entire Examination.

Second Division.

R. Felton.	|	D. Isaacs.	|	W. N. May.
F. P. Hughes.	|	A. Leeming.	|	J. McF. W. Pollard.
		A. M. Roome.		

July.

Honours Examination.

A. B. O'Brien.

Obtained the Exhibition and Medal in Anatomy and in Organic Chemistry.

R. W. Allen.

Obtained the Exhibition and Medal in Materia Medica and Pharmaceutical Chemistry, and Honours in Physiology and Histology.

C. M. Wenyon.

Obtained First Class Honours in Physiology and Histology, and Honours in Anatomy.

F. M. Longson.

Obtained Honours in Organic Chemistry.

Entire Examination.

First Division.

A. G. Jones.		E. Bellingham Smith.
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Second Division.

G. N. Bartlett.		M. de L. Robinson.		W. Welchman.
F. H. Lennox Jones.		T. Turner.		R. O. Williams.

Excluding Physiology.

First Division.

I. R. Cook.

Second Division.

P. C. P. Ingram.

Physiology only.

Second Division.

G. H. Rees.

Preliminary Scientific (M.B.) Examination.

January.

Chemistry and Experimental Physics.

G. F. E. Allison.	|	J. A. Bullbrook.
C. A. Basker.	|	H. E. H. Mitchell.

Biology.

S. W. Daw.	|	A. L. Foster.	|	A. Zorab.
A. W. F. Denning.		C. H. Marshall.		

July.

Entire Examination.

First Division

T. E. A. Carr.		C. A. L. Mayer.		G. F. Stebbing.
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Second Division.

W. P. H. Munden.

Chemistry and Experimental Physics.

H. C. Lacey.		D. Reynolds.
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Biology.

H. L. Morgan.		G. F. Syms.
M. J. Rattray.		St. J. A. M. Tolhurst.

Examination for the Degree of Doctor of Science.

F. G. Hopkins.		J. Wade.
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Final Examination for the Degree of Bachelor of Science.

F. T. H. Wood.

Intermediate Examination in Science.

First Division.

R. J. Reynolds.

Intermediate Examination in Science and Preliminary Scientific Examination conjointly.

Examination for Honours.

E. W. Giesen.

University of Durham.

Examination for the Degree of Doctor of Medicine for Practitioners of Fifteen Years' Standing.

G. F. Pollard.

Final Examination for the Degrees of Bachelor of Medicine and Surgery.

G. W. Smith.		M. C. Wetherell.
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Third Examination.

J. G. O. H. Lane.
A. A. Miller.

A. V. Maybury.
O. B. Travers.

Second Examination.

A. A. Miller.

Examination for the Diploma in Public Health.

A. Reid.

Royal College of Physicians in Ireland.

Diploma in State Medicine.

C. H. D. Rygate.

Royal College of Physicians of London.

Elected to the Fellowship.

John Fawcett.

Examination for the Diploma of Membership.

H. S. French		G. N. Meachen.		W. H. M. Telling.
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Examination for the Diploma in Public Health.

F. E. Fremantle.

Final Examination for the License.

January.

H. Barber

J. Evans.

C. H. Gask.

A. W. Gater.

G. S. C. Hayes.

H. A. Higgins.

C. R. Howard.

R. L. Jimenez.

A. D. E. Kennard.

W. P. Ker.

T. T. Kelly.

L. G. Nash.

P. N. Blake-Odgers.

M. J. Rees.

S. S. H. Shannon.

A. H. E. Wall.

J. L. Whatley.

April.

E. G. Allport.

E. Bigg.

M. W. Cohen.

H. A. Cutler.

H. Davies-Colley,

T. B. Fawley.

C. E. Gaitskell.

N. N. A. Houghten.

G. F. Humphreys.

P. D. Hunter.

A. C. Nash.

A. C. Osburn.

G. T. Wrench.

C. J. Pinching.

H. G. Rashleigh.

O. W. Richards.

F. W. Smith.

D. H. Trail.

W. E. J. Tuohy.

July.

A. C. Ambrose.	W. W. C. Jones.	R. D. Smedley.
K. Anderson.	E. H. Milsom.	F. M. V. Smith.
G. B. F. Churchill.	T. Morgan.	G. W. Smith.
R. T. Collins.	H. T. Palmer.	J. Smith.
W. J. Davies.	C. H. Robertson.	F. E. Welchman.
	M. C. Wetherell.	

October.

A. J. Beadel.	J. W. Gromitt.	S. L. Pallant.
H. Bentley.	F. D. S. Jackson.	G. S. Robertson.
W. L. M. Day.	R. C. Lawry.	T. M. Smith.
E. Faulks.	L. H. Moiser.	H. Tipping.

Royal College of Surgeons of Edinburgh.

Examination for the Fellowship.

A. H. B. Kirkman.

Royal College of Surgeons of England.

Final Examination for the Fellowship.

F. G. Cross.	H. T. Hicks.	R. H. J. Swan.
F. Curtis.	E. J. O'Meara.	A. R. Thompson.
D. G. Greenfield.	T. Pettay.	N. F. Ticehurst.
E. E. Henderson.	J. F. Robinson.	

First Examination for the Fellowship.

F. Barnes.	R. Felton.	A. H. Miller.
H. O. Cameron.	H. T. Hicks.	W. M. Mollison.
J. H. Clatworthy.	E. C. Hughes.	A. B. O'Brien.

Final Examination for the Membership.

January.

H. Barber.	C. R. Howard.	P. N. Blake-Odgers.
J. Evans.	R. L. Jimenez.	M. J. Rees.
C. H. Gask.	A. D. E. Kennard.	S. S. H. Shannon.
A. W. Gater.	W. P. Ker.	A. H. E. Wall.
G. S. C. Hayes.	T. T. Kelly.	J. L. Whatley.
H. A. Higgins.	L. G. Nash.	

April.

E. G. Allport.	O. E. Gaitskell	C. J. Pinching.
E. Bigg.	N. N. A. Houghton.	H. G. Rashleigh.
M. W. Cohen.	G. F. Humphreys.	O. W. Richards.
H. A. Cutler.	P. D. Hunter.	F. W. Smith.
H. Davies-Colley.	A. C. Nash.	D. H. Trail.
T. B. Fawley.	A. C. Osburn.	W. E. J. Tuohy
	G. T. Wrench.	

July.

A. C. Ambrose.	W. W. C. Jones.	R. D. Smedley.
K. Anderson.	E. H. Milsom.	F. M. V. Smith.
G. B. F. Churchill.	T. Morgan.	G. W. Smith.
E. T. Collins.	H. T. Palmer.	J. Smith.
W. J. Davies.	C. H. Robertson.	F. E. Welchman.
	M. C. Wetherell.	

October.

A. J. Beadell.	J. W. Gromitt.	S. L. Pallant.
H. Bentley.	F. D. S. Jackson.	G. S. Robertson.
W. L. M. Day.	R. C. Lawry.	T. M. Smith.
E. Faulks.	L. H. Moiser.	H. Tipping.

Society of Apothecaries of London.

A. H. Bell.	H. S. French.	H. Johnson.
C. J. Francis.	G. W. C. Hollist.	T. G. Miles.

Naval Medical Service.

S. S. H. Shannon.

Indian Medical Service.

L. Hirsch. | F. W. Sims.

MEDALLISTS AND PRIZEMEN.

JULY, 1903.

Open Scholarships in Arts.

Thomas Stansfield, Reading School, £100.

Philip Hirschbein, Owen's School, Islington, £50.

Harry Archibald Sandford, Roan's School, Greenwich, Certificate.

Edward Leslie Martyn Lobb, Rydal Mount School, Certificate.

Open Scholarships in Science.

Thomas Edmund Ashdown Carr, Guy's Hospital, £150.

Kenelm Hutchinson Digby, Guy's Hospital, £60.

George French Stebbing, Guy's Hospital, Certificate.

Scholarship for University Students.

Hector Charles Cameron, St. John's College, Cambridge	} equal £25 each.
Ronald Edgar French, King's College, Cambridge	
Arthur Hallows Miller, Trinity College, Cambridge, Certificate.	

Open Scholarships in Dental Mechanics.

October, 1902, Albert Harris, £30.

May, 1903, Herbert Snell, £20.

Junior Proficiency Prizes.

Herbert Orpe Brookhouse, £20.

George Cockcroft, £15.

Thomas Bramley Layton, £10.

The Michael Harris Prize for Anatomy.

Herbert Orpe Brookhouse	} equal £5 each.
George Cockcroft	

Thomas Bramley Layton, Certificate.

The Wooldridge Memorial Prize for Physiology.

Herbert Orpe Brookhouse, £10.

George Cockcroft, Certificate.

Thomas Bramley Layton, Certificate.

The Hilton Prize for Dissections (1902).

Arthur Boniface O'Brien, £3.

Howard Vincent Mitchell, £2.

The Arthur Durham Prizes for Dissection.

First Year's Students.

Ernest William Giesen, £5.

Kenelm Hutchinson Digby, Certificate.

Senior Students.

William Henry Miller, £15.

William Henry Trethowan, Certificate.

Patrick Francis McEvedy, Certificate.

Dental Prizes.

First Year's Students.

Arthur Alan Forty, £10.

Herbert Poyton, Certificate.

Second Year's Students.

Richard Roberts, £15.

Albert Edgar Dunkin Prideaux, Certificate.

Practical Dentistry Prize.

Albert Edgar Dunkin Prideaux, £10.

Richard Roberts, Certificate.

The Treasurer's Gold Medal for Clinical Medicine.

Neville Ivens Spriggs.

Henry Francis Bell Walker, Proxime Accessit.

The Treasurer's Gold Medal for Clinical Surgery.

Gerald Charles Frederick Robinson.

The Golding-Bird Gold Medal and Scholarship in Bacteriology.

Neville Ivens Spriggs, £20.

THE PHYSICAL SOCIETY.

Honorary President.—SIR SAMUEL WILKS, Bart., M.D., LL.D., F.R.S.

Secretaries.—E. I. Spriggs, M.D., and R. P. Rowlands, M.B., B.S.

Presidents.

Kenneth Black, J. M. Brydone, B.A., M.B., B.C., S. Hodgson, M.B., B.S., P. N. Blake-Odgers, B.A., M.B., B.Ch., C. H. Robertson, M.B., P. R. Bolus, G. Evans, M.B., E. H. B. Milsom, H. F. Bell Walker, Owen Richards, M.A., M.B., B.Ch., A. C. H. Gray, M.B., F. W. Morton-Palmer, B.A., G. A. Ticehurst, B.A., W. M. Mollison, B.A.

PRIZEMEN FOR THE SESSION 1902-1903.

The Society's Prize of £10 was awarded to Mr. J. M. Brydone, M.A., M.B., B.C., for his Paper on "The After Treatment of Abdominal Operations," and Mr. K. Black gained the Treasurer's Prize of £5 for his Paper on "The Pathology of Chorea."

CLINICAL APPOINTMENTS HELD DURING THE YEAR 1902.

HOUSE PHYSICIANS.

J. A. B. Hammond. D. G. Greenfield. W. M. Robson.	G. Clarke. K. V. Trubshaw. J. Atkins.	T. H. B. Dobson. A. Pearson.
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HOUSE SURGEONS.

N. F. Ticehurst. A. H. E. Wall. H. W. Brown.	M. A. Collins. A. C. H. Gray. W. H. Bowen.	G. G. Davidson. P. N. B. Odgers.
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ASSISTANT HOUSE SURGEONS.

A. Wylie. K. V. Trubshaw. H. C. Keates. P. N. B. Odgers. H. W. Brown. W. H. Bowen. G. T. Wrench. C. H. Robertson.	G. G. Davidson. E. I. Claxton. W. M. Robson. A. Pearson. C. Tessier. W. G. Parker. H. A. Cutler. F. C. Wetherell.	R. S. Roper. J. Atkins. A. C. H. Gray. S. Hodgson. J. F. Robinson. A. C. Ranford. C. J. Pinching. A. H. E. Wall.
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ASSISTANT HOUSE PHYSICIANS.

T. H. B. Dobson. K. V. Trubshaw. H. Barber.	D. G. Greenfield. J. Atkins. C. Tessier.	A. Pearson. W. M. Robson.
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RESIDENT OBSTETRIC ASSISTANTS.

G. Lewin.	F. Curtis.	R. S. Roper.
E. Stott.	F. G. Cross.	H. C. Keates.
J. A. Glover.	W. E. H. Tuohy.	H. K. Lacey.

CLINICAL ASSISTANTS.

J. Atkins.	S. Hodgson.	H. C. Keates.
P. N. B. Odgers.	W. M. Robson.	W. H. Bowen.
H. W. Brown.	W. G. Parker.	C. Tessier.
F. L. Thomas.	G. T. Wrench.	H. Barber.
H. A. Cutler.	N. N. A. Houghton.	C. J. Pinching.
C. H. Robertson.	F. C. Wetherell.	A. H. E. Wall.
M. J. Rees.	F. H. Parker.	O. W. Richards.
L. H. Moiser.	D. H. Trail.	A. R. Thompson.

CLINICAL ASSISTANTS IN THE MEDICAL WARDS.

H. Barber.	E. Faulks.	C. J. Pinching.
D. H. Trail.	J. B. Copland.	H. T. Palmer.
G. Warwick Smith.	A. J. Beadel.	G. E. Malcomson.
G. Evans.	H. Tipping.	B. Glendinning.
J. H. Donnell.	K. Black.	J. D. Pearson.
E. W. Strange.		

CLINICAL ASSISTANTS IN SURGICAL WARDS.

S. L. Pallant.	J. M. Bickerton.	E. H. Griffin.
R. G. Anderson.	F. C. Robinson.	D. R. T. Griffiths.
G. F. Hardy.	W. C. Lewis.	

SURGEONS' DRESSERS.

C. H. Bubb.	H. Johnson.	H. C. Winckworth.
J. S. Cooper.	J. Braithwaite.	G. L. Buckeridge.
J. T. Hicks.	N. I. Spriggs.	T. C. Lucas.
A. R. Wilson.	H. M. Woodward.	H. S. Brown.
C. M. Anthony.	E. N. Jupp.	C. R. Shattock.
R. E. Brayne.	C. E. Adams.	L. S. H. Glanville.
F. C. Robinson.	L. H. Ackroyd.	A. R. Brailey.
J. Goss.	D. R. Pike.	P. W. Hammond.
C. H. Dawe.	C. H. Reinhold.	F. H. Wallace.
J. T. Hicks.	J. Bromley.	R. Moyle.
H. W. Bethell.	R. Willan.	F. C. Knight.
H. D. Smart.	H. Watts.	E. L. Ward.
H. E. Morris.	W. H. Bush.	H. B. German.
R. Larkin.	H. Mann.	C. D. Pye-Smith.
G. Carlisle.	W. T. P. Meade-King.	P. R. Bolus.
G. F. Hardy.	M. B. Taylor.	H. O. M. Beadnell.
C. E. Iredell.	J. W. Dadd.	F. P. Hughes.
S. E. Bowle.	F. G. Goble.	B. W. Lacey.
P. A. Peall.	K. Black.	P. P. Cole.
E. H. B. Milsom.	C. S. Morris.	H. F. B. Walker.
M. G. Louisson.	H. H. Jenkins.	R. St. G. Seagrove.
R. A. Greeves.	G. Nunn.	M. J. Mottram.
A. E. F. Kynaston.	J. F. Ray.	E. Lloyd.
A. M. Webber.	L. H. Frankenberg.	H. H. Carter.
O. V. Payne.	G. A. Ticehurst.	B. H. Stewart.
G. H. Rees.	G. C. F. Robinson.	

ASSISTANT SURGEONS' DRESSERS.

R. Moyle.	R. Willan.	H. W. Bethell.
R. St. G. Seagrove.	C. H. Dawe.	H. D. Smart.
M. J. Mottram.	H. H. Jenkins.	C. H. Reinhold.
R. Larkin.	H. Watts.	F. H. Wallace.
E. L. Ward.	J. Bromley.	D. H. Richards.
G. C. F. Robinson.	G. Nunn.	F. P. Hughes
P. A. Peall.	B. W. Lacey.	O. Black.
C. E. Iredell.	K. Black.	G. Carlisle.
F. G. Goble.	W. T. P. Meade-King.	P. R. Bolus.
H. Mann.	C. D. Pye-Smith.	E. H. Milsom.
C. S. Morris.	J. W. Dadd.	M. B. Taylor.
H. O. M. Beadnell.	S. C. Bowle.	P. P. Cole.
H. H. Carter.	L. H. Frankenberg.	E. Lloyd.
A. M. Webber.	M. G. Louisson.	H. F. B. Walker.
O. V. Payne.	G. A. Ticehurst.	A. E. F. Kynaston.
H. R. Griffith.	B. Moiser.	B. H. Stewart.
J. F. Rey.	R. P. Rowlands.	F. Alcock.
R. A. Greeves.	R. Franklin.	W. S. Orton.
J. D. Thomas.	A. V. Maybury.	A. F. Hertz.
F. W. M. Palmer.	R. D. Bridger.	F. B. Lowe.
C. J. S. Dismorr.	R. M. Rendall.	E. C. Myott.

DENTAL SURGEONS' DRESSERS.

A. H. E. Wall.	W. J. Davies.	A. C. Osburn.
W. A. G. Stevens.	G. Moir.	D. H. Trail.
F. H. Parker.	E. H. Griffin.	R. D. Smedley.
A. H. Turner.		

CLINICAL ASSISTANTS IN MEDICAL OUT-PATIENTS.

W. W. C. Jones.	J. W. Gromitt.	R. T. Collins.
R. C. Lawry.	T. M. Smith.	L. H. Moiser.
F. H. Parker.	J. F. Douse.	P. W. Hamond.
H. S. Jones.	W. H. Cole.	A. P. Piggot.
W. W. Read.		

OPHTHALMIC DRESSERS.

G. B. Churchill.	B. Glendining.	T. M. Smith.
C. R. Howard.	G. Moir.	C. F. Fraser.
C. H. Denyer.	B. Rahim.	C. M. Murray.
W. H. Brailey.	F. M. V. Smith.	G. Buckeridge.
O. W. Richards.	R. E. Brayne.	A. P. Piggot.
W. E. J. Tuohy.	D. H. Trail.	M. A. Collins.
G. W. Hollist.	M. C. Wetherell.	L. H. Glanville.
S. L. Pallant.	T. C. Lucas.	C. H. Dawe.
H. M. Goldstein.	G. G. Davidson.	E. H. B. Milsom.
G. S. Robertson.	D. W. Smith.	J. Bromley.
H. W. Bethell.	N. I. Spriggs.	F. C. Robinson.

DRESSERS IN THE THROAT DEPARTMENT.

F. D. S. Jackson.	H. W. Brown.	M. W. Cohen.
H. A. Cutler.	H. T. Palmer.	H. P. Wiltshire.
G. B. Churchill.	C. H. Robertson.	G. F. Humphreys.
F. H. Parker.	W. C. Lewis.	G. E. Malcomson.
F. W. Fawcett.	J. T. Hicks.	N. N. A. Houghton.
G. G. Davidson.	B. Glendinning.	J. Goss.

CLERKS IN THE THROAT DEPARTMENT.

C. H. Denyer.	E. C. Myott.	A. H. Turner.
G. C. F. Robinson.	P. A. Peall.	O. Black.
E. C. Peers.	C. H. Reinhold.	

MEDICAL WARD CLERKS.

P. R. Bolus.	P. A. Peall.	C. D. Pye-Smith.
H. Mann.	K. Black.	G. Carlisle.
H. A. Beadnell.	E. H. B. Milsom.	B. W. Lacey.
F. G. Goble.	W. T. Meade King.	P. P. Cole.
J. F. Rey.	F. B. Lowe.	R. P. Rowlands.
A. M. Webber.	A. E. F. Kynaston.	M. G. Louisson.
H. H. Carter.	G. H. Rees.	B. Moiser.
M. B. Taylor.	H. F. B. Walker.	L. H. Frankenberg.
B. H. Stewart.	E. Lloyd.	L. J. Orpen.
R. A. Greeves.	G. A. Ticehurst.	G. Nunn.
O. V. Payne.	R. St. G. Seagrove.	A. M. Webber.
F. Rogerson.	R. Franklin.	W. S. Orton.
R. D. Bridger.	C. S. Dismorr.	C. P. Harvey.
R. M. Rendall.	A. V. Maybury.	M. T. Mottram.
H. H. Jenkins.	J. E. Spiller.	J. D. Thomas.
G. C. F. Robinson.	E. C. Myott.	F. W. M. Palmer.
A. F. Hertz.	J. H. Clatworthy.	G. Russell.
F. Barnes.	A. M. Benett.	G. H. Cheyney.
J. M. Barrionuevo.	J. F. Pollard.	J. E. Prentis.
D. Isaacs.	H. D. Wyatt.	W. N. May.
W. Reeve.	W. M. Mollison.	C. P. Harvey.
E. W. Routley.	R. Felton.	A. R. Beaumont
A. Leeming.	J. O. Musson.	A. M. Roome.
J. Cook.	P. A. S. Dyson.	R. Edridge.
P. F. Minett.	L. Myer.	A. S. Littlejohns.
S. M. Wells.	E. C. Hughes.	C. M. Stevenson.
H. M. Clarke.	E. W. Sheaf.	
F. P. Hughes.	C. E. Iredell.	

ASSISTANT PHYSICIANS' CLERKS.

C. S. Morris.	J. W. Dadd.	C. D. Pye-Smith.
K. Black.	B. I. Rahim.	E. H. B. Milson.
S. C. Bowle.	H. Mann.	M. B. Taylor.
P. P. Cole.	H. T. B. Walker.	M. G. Louisson.
A. M. Webber.	G. H. Rees.	H. H. Carter.
J. E. Spiller.	R. Franklin.	E. C. Myott.
A. F. Hertz.	G. Russell.	C. W. L. Cowper.
D. Isaacs.	J. F. Pollard.	J. M. Barrionuevo.
W. M. Mollison.	J. H. Clatworthy.	

SURGICAL WARD CLERKS.

F. Rogerson.	R. Franklin.	F. Barnes.
R. D. Bridger.	J. D. Clatworthy.	W. S. Orton.
R. M. Rendall.	O. Black.	R. Edridge.
C. P. Harvey.	A. R. Beaumont.	C. Dismorr
A. V. Maybury.	J. E. Spiller.	J. D. Thomas.
F. Alcock.	A. W. Hertz.	W. M. Mollison.
E. C. Myott.	F. W. M. Palmer.	A. M. Roome.
T. M. Barrionuevo.	A. M. Bennett.	G. H. Cheyney.
D. Isaacs.	W. Reeve.	W. N. May.
E. W. Routley.	C. W. Ponder.	J. M. Pollard.
J. E. Prentis.	H. D. Wyatt.	D. Doudney.
R. Felton.	A. Leeming.	J. O. Musson.
J. Cook.	T. F. Minett.	L. Myer.
E. C. Peers.	P. A. S. Dyson.	A. S. Littlejohns
S. M. Wells.	E. C. Hughes.	C. M. Stevenson.
H. M. Clarke.	E. W. Sheaf.	A. Morris.
M. H. Oliver.	L. J. Patterson Clavier	R. O. Williams.
H. P. Costobadie.	T. M. Longson.	T. Turner.
G. H. Clough.	A. B. Cocker.	G. F. Greening.
F. H. Lennox Jones.	R. P. Lewis.	H. V. Mitchell.
J. E. Scales.	W. Welchman.	E. White.
L. G. Davies.	C. M. Wenyon.	A. S. B. Bankart.
R. A. Chisholm.		

CLERKS IN THE SKIN DEPARTMENT.

E. Faulks.	S. C. Bowle.	S. Hodgson.
J. D. Pearson.	E. G. Goldie.	F. W. Fawcett.
W. W. Read.	O. B. Travers.	

AURAL SURGEON'S DRESSERS.

A. H. E. Wall.	J. W. Gromitt.	J. C. O. Bradbury.
C. B. Penny.	G. B. Churchill.	D. Forsyth.
T. H. F. Roberts.	D. H. Trall.	F. H. Parker.
E. H. Griffin.	W. G. Parker.	B. I. Rahim.

ASSISTANT SURGEONS' CLERKS.

A. Leeming.	E. C. Hughes.	W. Reeve.
J. M. Barrionuevo.	O. Black.	A. R. Roome.
J. D. Bridger.	D. Isaacs.	J. E. Prentis.
R. Felton.	H. W. Pollard.	G. Russell.
H. V. Mitchell.	A. B. O'Brien.	A. G. Jones.
L. H. Burner.	R. W. Allen.	G. W. Nicholson.
R. E. French.	F. M. Longson.	M. De L. Robinson.

POST-MORTEM CLERKS.

N. I. Spriggs.	H. Watts.	A. R. Brailey.
J. S. Cooper.	F. H. Wallace.	O. H. Reinhold.
F. H. Parker.	W. H. Bush.	F. W. Fawcett.
W. L. M. Day.	C. L. Pallant.	F. Richmond.
P. C. V. Bent.	J. Goss.	R. G. Anderson.
W. H. Cole.	E. W. Strange.	H. Ackroyd.
T. O. Lucas.	P. W. Hamond.	E. G. Goldie.

OBSTETRIC DRESSERS.

G. W. Smith.	A. C. Ransford.	C. H. Denyer.
W. G. Parker.	E. G. Goldie.	C. E. Bartlett.
A. P. Piggot.	H. M. Goldstein.	W. W. Read.
W. J. Davies.	E. W. Strange.	B. H. Wedd.
J. H. Donnell.	F. L. Thomas.	C. F. Fraser.
J. M. Bickerton.	G. L. Buckeridge.	D. H. Richards.
R. G. Anderson.	W. L. M. Day.	P. W. Hamond.
L. Pallant.	T. C. Lucas.	M. B. Taylor.
W. H. Bush.	H. B. German.	

EXTERN OBSTETRIC ATTENDANTS.

C. E. Bartlett.	C. H. Denyer.	H. L. Shelton.
F. C. Knight.	F. M. V. Smith	F. Goss.
J. B. Copland.	H. Tipping.	C. H. Robertson.
W. F. Box.	A. J. Beadel.	L. H. Moiser.
A. Moon.	F. J. Turner.	H. S. Jones.
A. P. Piggot.	E. W. Strange.	E. G. Goldstein.
K. Anderson.	S. L. Pallant.	G. W. Smith.
W. L. M. Day.	A. J. Urquhart.	C. H. Dawe.
P. W. Hamond.	B. Glendining.	B. H. Wedd.
J. M. Bickerton.	H. S. Brown.	E. H. Griffin.
J. Braithwaite.	P. C. V. Bent.	F. W. Fawcett.
E. G. Goldie.	R. G. Anderson.	L. S. H. Glanville.
H. R. Grellet.	E. H. B. Milsom.	O. B. Travers.
C. F. Fraser.	W. W. Read.	G. L. Buckeridge.
T. C. Lucas.	D. H. Richards.	D. R. Pike.
H. C. Wlnckworth.	C. E. Adams.	H. E. Morris.
A. Croneen.	J. T. Hicks.	A. R. Brailey.
N. I. Spriggs.	H. Ackroyd.	J. S. Cooper.
C. M. Anthony.	R. Willan.	W. H. Bush.
J. H. Donnell.	E. N. Jupp.	C. H. Bubbs.
F. C. Robinson.	R. E. Brayne.	P. R. Bolus.
H. B. German.	J. W. Dadd.	C. E. Iredell.
S. C. Bowle.	C. H. Reinhold.	R. Larkin.
H. Watts.	F. G. Goble.	W. T. Meade King.

CLERKS TO ANÆSTHETISTS.

T. B. Fawley.	R. C. Lawry.	G. L. Buckeridge.
V. M. Wallis.	F. C. Robinson.	H. Barber.
E. W. Strange.	M. W. Cohen.	F. J. F. Jones.
C. R. Howard.	F. L. Thomas.	A. C. Ransford.
G. F. Humphreys.	C. J. Pinching.	G. E. Malcomson.
W. W. Read.	S. L. Pallant.	F. H. Parker.
E. G. Goldie.	J. D. Pearson.	W. A. G. Stevens.
P. C. V. Bent.	A. J. Beadel.	R. G. Anderson.
F. W. Fawcett.	J. Goss.	N. N. A. Houghton.
W. L. M. Day.	J. H. Donnell.	A. W. Iredell.
D. H. Trail.	C. H. Robertson.	E. H. Denyer.
M. C. Wetherell.	A. Croneen.	H. M. Goldstein.
B. Rahim.	W. E. J. Tuohy.	J. T. Hicks.
W. C. Lewis.	H. S. Brown.	C. R. Shattock.
F. C. Knight.	R. Larkin.	C. H. Dawe.
J. Bromley.	A. R. Wilson.	A. H. Turner.
R. E. Brayne.	H. S. Jones.	C. H. Reinhold.
L. S. H. Glanville.	S. C. Bowle.	A. R. Brailey.
D. R. Pike.	H. Mann.	H. W. Bethell.
H. W. Smart.	F. H. Wallace.	H. M. Woodward.
N. I. Spriggs.		

DENTAL SCHOOL

APPOINTMENTS HELD DURING THE YEAR 1902.

DENTAL HOUSE SURGEONS.

W. E. Griffin.	H. C. Visick.	P. Scott.
J. C. Spiller.		

ASSISTANT DENTAL HOUSE SURGEONS.

J. A. Donald.	P. Scott.	H. Croot.
H. P. Aubrey.	C. Farrant.	L. U. Ransford.
A. D. Crofts.	A. L. Mason.	

DEMONSTRATORS IN CONSERVATION ROOM.

E. Farrant.	A. L. Mathews.	W. R. Penfold.
H. P. Hooper.	A. L. Mason.	F. W. Parfitt.
G. L. Dymott.	C. J. S. Klizczewski.	A. E. D. Prideaux

DRESSERS IN THE GAS ROOM.

J. G. Morrell.	H. E. Chinneck.	W. R. Penfold.
W. Reynolds.	W. J. Goodman.	N. B. Soper.
H. P. Aubrey.	A. Goodey.	R. H. C. Johnson.
T. Vernon.	F. N. Fox.	H. W. Gwyther.
H. J. Fox.	H. Croot.	H. J. Cole.
A. L. Mathews.	W. E. Derriman.	F. Barkshire.
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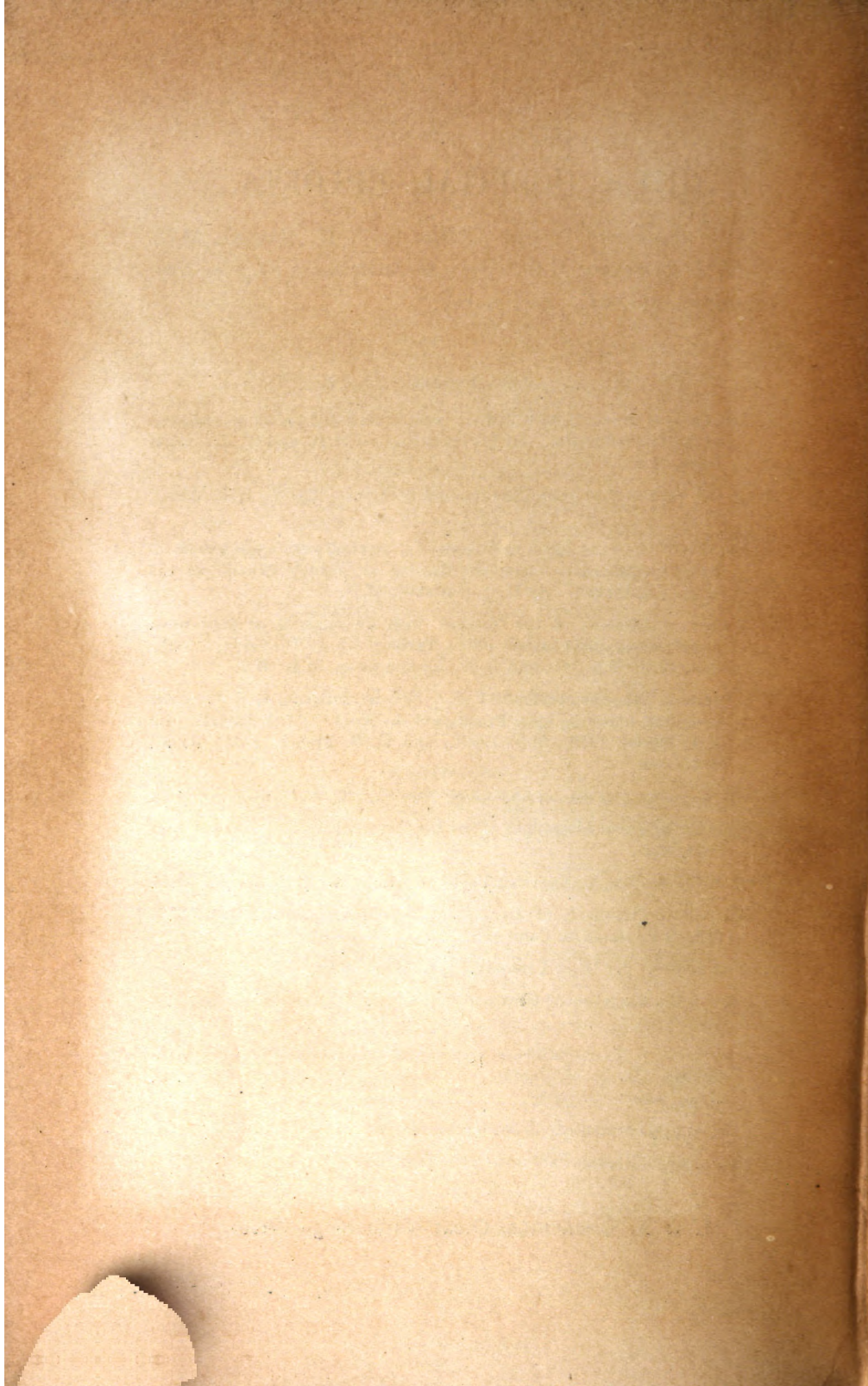
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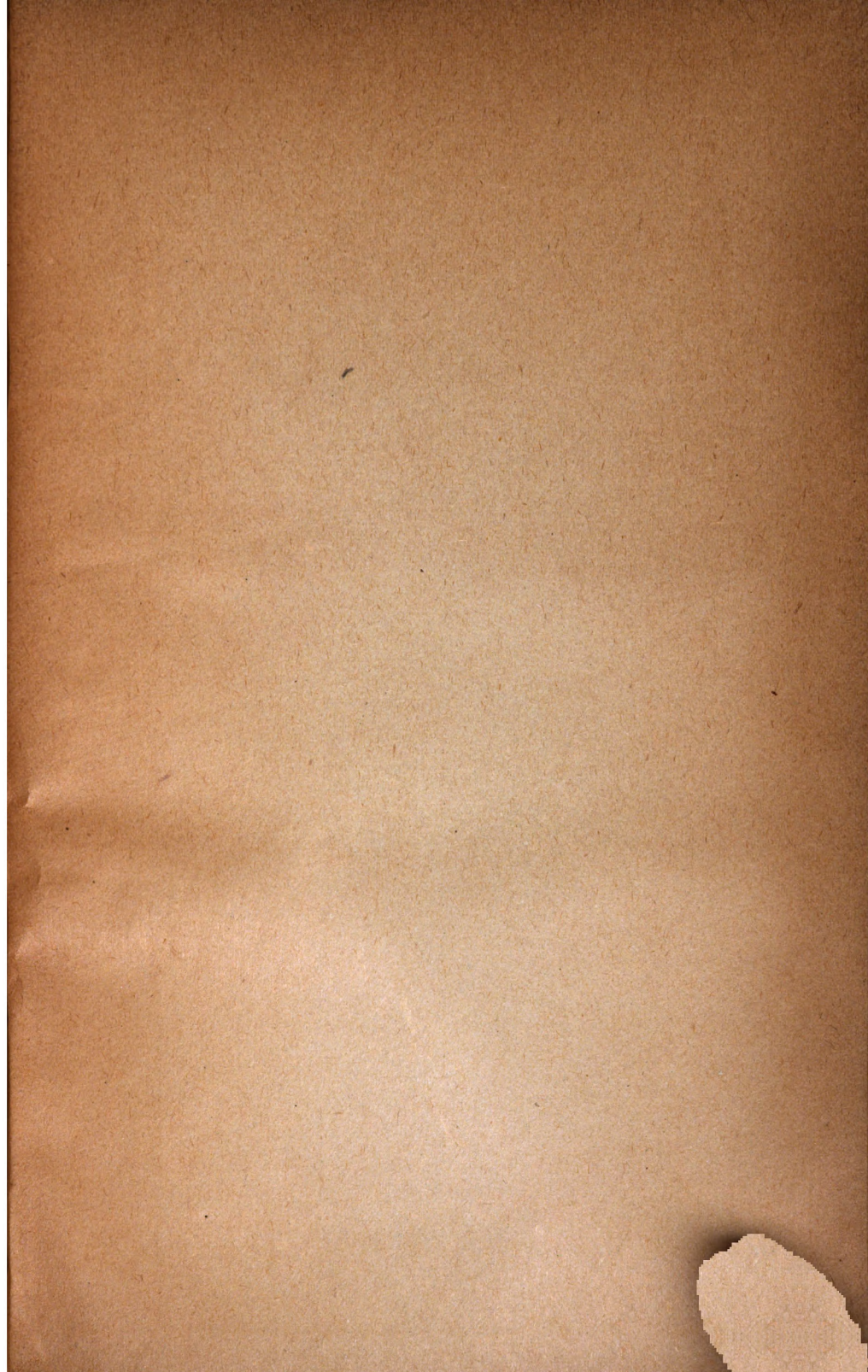
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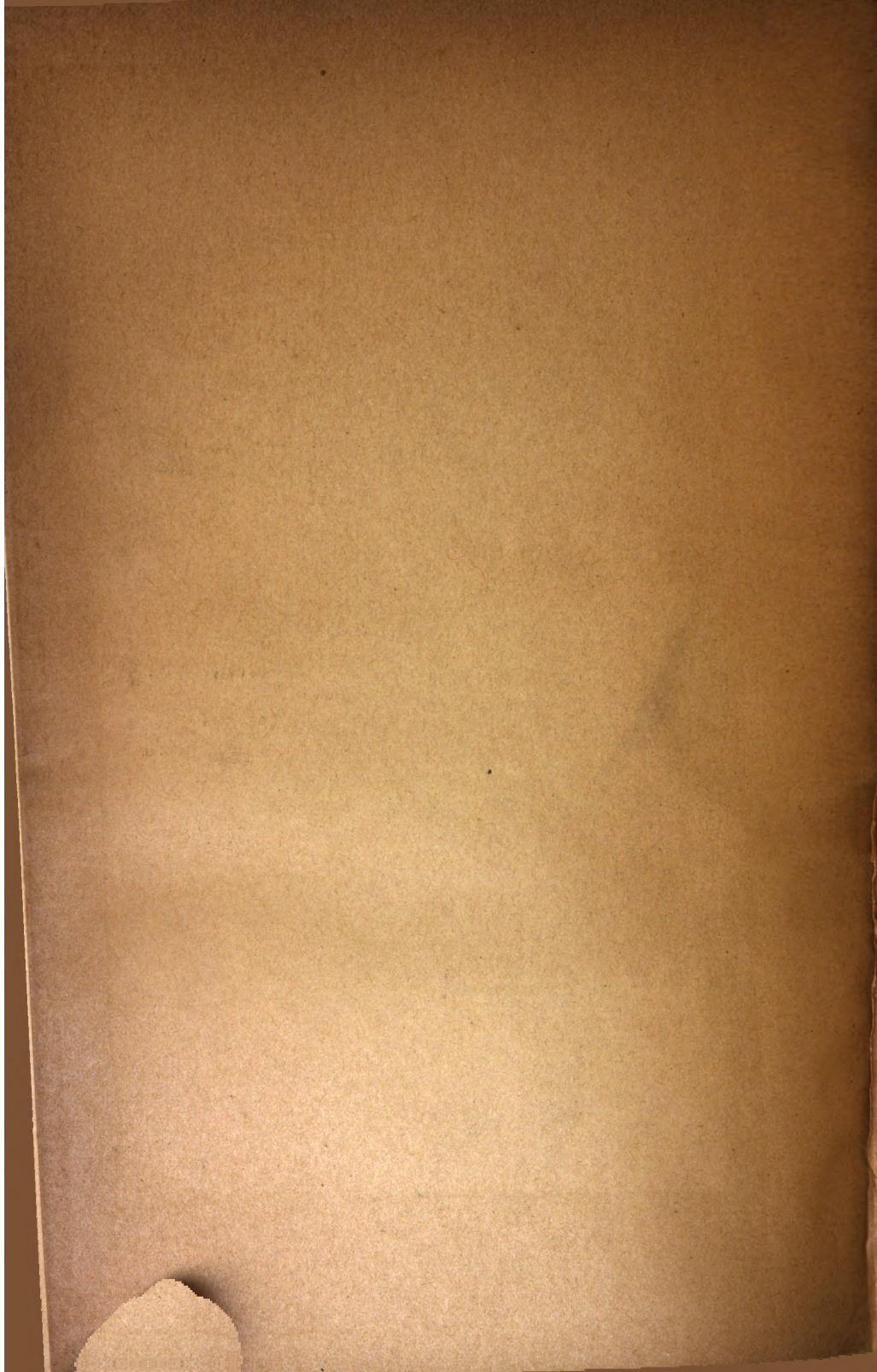
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